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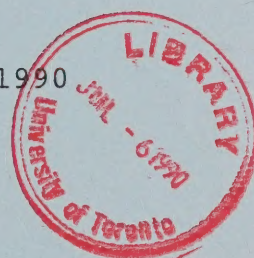
VOLUME: 217

DATE: Wednesday, June 20, 1990

BEFORE:

A. KOVEN, Chairman

E. MARTEL, Member



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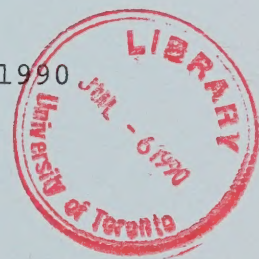
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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the
Honourable Jim Bradley, Minister of the
Environment, requiring the Environmental
Assessment Board to hold a hearing with
respect to a Class Environmental
Assessment (No. NR-AA-30) of an
undertaking by the Ministry of Natural
Resources for the activity of timber
management on Crown Lands in Ontario.


Hearing held at the offices of the Ontario
Highway Transport Commission, Britannica
Building, 151 Bloor Street West, 10th Floor,
Toronto, Ontario, on Wednesday, June
20th, 1990, commencing at 9:00 a.m.

VOLUME 217

BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member



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1 ---Upon commencing at 9:00 a.m.

2 MADAM CHAIR: Please be seated.

3 MR. HANNA: Good morning, Madam Chair,
4 Mr. Martel.

5 MADAM CHAIR: Good morning, Mr. Hanna.

6 WILSON EEDY,
7 KARL SCHIEFER,
8 GORDON CRAIG, Resumed

9 CONTINUED CROSS-EXAMINATION BY MR. HANNA:

10 Q. Dr. Eedy, there are two matters
11 outstanding from yesterday that I would like to clarify
12 or clear up, if we can.

13 The first is the Smith article. Did you
14 have a chance to determine whether or not he defined
15 the size of clearcuts when he used the words "large
16 clearcut"

17 DR. EEDY: A. The answer to that is a
18 little bit ambiguous because Dr. Smith is somewhat of a
19 philosophical writer and doesn't stick strictly to easy
20 fact, and I presume this is a symposium paper, not a
21 refereed sort of paper, where it may have been
22 clarified a little more.

23 He talks around the subject. In one
24 place he calls small forest area 60 hectares and in
25 another place he talked about large forest areas being
in the 30, 40 hectare range, but when he talks about

1 large clearcuts he doesn't specify what the range is.

2 I might note that this paper is really
3 related to clearcutting in hardwood forests in the New
4 England area and I think as a consequence since -- my
5 understanding is that clearcutting is not really a
6 major forest harvesting method in the Great Lakes/St.
7 Lawrence or the hardwood forest areas.

8 I don't know how practical -- or how
9 applicable it really is to a boreal forest situation.

10 Q. Okay. The second matter that was
11 outstanding was relating to your witness statement,
12 page 7, the fifth action that you identified there. We
13 agreed that that recommendation or that action had
14 applied to the boreal forest, and I was -- I had asked
15 you if you could put your mind to giving us similar
16 wording that you would see for the Great Lakes/St.
17 Lawrence Forest?

18 A. I put my mind to it. I think perhaps
19 what I'm lacking is somewhat a total understanding of
20 the harvesting activities. As a wildlife biologist, I
21 am not certainly not a forester, but from what I do
22 understand of forestry I really feel that the whole
23 concept of even-age classess and clearcutting and this
24 sort of thing really doesn't apply to the Great
25 Lakes/St. Lawrence Forest and the harvesting there, and

1 I really couldn't think of something which would be
2 similar as a recommendation.

3 Q. Okay. Yesterday we left off at the
4 end of the day talking about the statement on page 10
5 of your witness statement regarding the endorsement of
6 the monitoring proposals of the Ministry of Natural
7 Resources and we are dealing specifically with 52(a),
8 which is the proposal to deal with the moose
9 monitoring -- the efficacy of the guidelines in terms
10 of moose, what's called the moose monitoring affects
11 study.

12 We had talked about also the OFAH term
13 and condition 92 which dealt likewise with affects
14 monitoring and I believe when we left off you'd said
15 that you felt what was proposed in 92 seemed reasonable
16 also, and I suggested that I felt that I was somewhat
17 perplexed because I had, in my view, two opposing
18 alternative approaches and I had asked you to examine
19 the paper by Dean Baskerville which is Exhibit 79,
20 where he deals with the matter of cumulative
21 environmental impacts.

22 I would like now to address that matter
23 with you in order to clarify exactly what is it you are
24 endorsing in terms of your recommendation there on --
25 or your statement on page 10 and also your statements

1 with respect to the OFAH terms and conditions.

2 Now, first of all, I believe we did
3 conclude yesterday that the adaptive management
4 approach resolves around the use of management actions
5 as the experimental basis for learning rather than
6 using formal scientific controlled studies. Do you
7 agree with that?

8 A. I really don't agree with that and
9 perhaps I could explain. I spent a fair bit of time, I
10 actually went through Dean Baskerville's papers, both
11 the Exhibit 378 and 979, and also reread some of his
12 other papers, such as the audit paper, and to be
13 honestly truthful I sympathize with Madam Chair's
14 comment the other day that -- I have a lot of respect
15 for Dean Baskerville and, in fact, I have him working
16 for me on a project including environmental studies of
17 forest activities.

18 At the same time, I find his writing is
19 extremely philosophical and he places a lot of
20 importance on labeling things and defining terms which
21 sometimes I find somewhat difficult. I have never been
22 one to use big words to mean things and quite often I
23 have difficulty understanding people who do, in spite
24 of the fact that I had taught courses like taxonomy. I
25 can never remember the Latin names for things and I've

1 never been hung up on this.

2 Adaptive management was originally
3 defined by Hollings in 1978 and although I haven't read
4 his volume on that recently, I believe that the concept
5 that both he and Baskerville are talking about is
6 really the scientific method and it's just another new
7 name or a new label that's been put on something that
8 has been around since the ancient Greeks, and this
9 scientific method is the basis of all good scientific
10 research.

11 Basically it says that you have rigorous
12 definition of your hypothesis or your model that you're
13 working with, this is a testable and that you go
14 through an iterative process which, as time goes on and
15 as more data is accumulated, you test that hypothesis
16 and you improve on it and you get it as close as you
17 can to being absolutely truth with the understanding
18 that the basis of science says that nothing is -- ever
19 reaches that absolute point where you can say that I
20 guarantee this is absolutely true and that there is no
21 circumstance under which it won't be true.

22 I think that this system, as I said, is
23 the basis of all good science and I don't think one can
24 argue with it. I do not feel that the testing that
25 could be done of the moose guidelines prohibits

1 utilizing a scientific method and an iterative approach
2 and the ability to improve these as time goes on.

3 Likewise, I feel that the approach which
4 is defined, the affects monitoring in the OFAH
5 condition 92, also has -- or all their conditions
6 basically looks at a scientific approach where there
7 are hypotheses and there is a testable iterative
8 process.

9 I think I agree with what I think Mr.
10 Hanna was getting at yesterday in that my personal
11 feeling is that a habitat suitability modelling
12 approach allows a little more rigorous scientific
13 method, and if one were to agree with the conclusions
14 that ESSA reached in Exhibit 381, that affects
15 monitoring of the moose guidelines could take,
16 depending on which system one used, between 10 to 20
17 years before the effectiveness of these guidelines are
18 proven, I feel that the habitat suitability or habitat
19 supply analysis approach may allow a quicker and
20 perhaps more cost effective approach to defining this.

21 It certainly will allow a great deal of
22 flexibility on a site-specific case which is something
23 that I feel is necessary whether one uses the guideline
24 approach or not.

25 I also note with reference to Dr.

1 Baskerville that he very strongly recommends against a
2 constraint approach which the guidelines, I guess, are
3 more of a constraint approach than the habitat supply
4 analysis. At the same time, our recommendations are
5 the guidelines, if they are used, be made flexible on a
6 site-specific basis so that they would be less of a
7 constraint. I feel if they were applied uniformly
8 across the whole area they would be definitely a
9 constraint rather than a management approach.

10 So I guess my answer to the whole
11 question is that I see definite benefits in both and on
12 a personal basis from a wildlife biologist perspective,
13 I have a great deal of hope and faith in the
14 development of the habitat supply analysis approach.

15 I am not certain that that approach is
16 totally proven, at the same time, I don't think the
17 guidelines are totally proven and I don't feel that I
18 can strongly recommend one or the other as being
19 absolutely the best method.

20 Q. Dr. Eedy, I would like to go back to
21 the original question I asked you because I don't think
22 I have an answer to it.

23 Does the adaptive management approach
24 revolve around the use of management actions as
25 experiments rather than using formal controlled

1 scientific studies --rather than using controlled
2 formal studies?

3 A. Again, I think this is labeling
4 something.

5 Q: What's labeling?

6 A. I guess if one were to say that
7 that's the term, adaptive management, you would be
8 correct, but my feeling is that from -- and I guess
9 more than reading Hollings than Baskerville, again, is
10 that one is testing hypotheses and whether you call
11 these hypotheses management systems or scientific
12 hypotheses I don't think is really a critical issue.

13 Q. Okay. Let me just take a step back.
14 I don't disagree with you that adaptive management is,
15 for intents and purposes, a replicate of the scientific
16 method.

17 The primary difference - and I ask you
18 this - the primary difference that I see is that
19 instead of using experimental research and then
20 applying it in management, that the research becomes
21 the management itself, and is that not the essence - if
22 you look on page 363 of Exhibit 378 - is that not the
23 essence of the steps that Dean Baskerville lays out
24 there, particularly step No. 4, the action is
25 implemented in the natural system? The action is the

1 management action; is it not?

2 It is not a scientific application or how
3 should I say, it's not necessarily in a controlled
4 environment type of experiment - and we will be getting
5 to his other paper which I will be referring to
6 shortly, 979 - and that's one of the major messages he
7 leaves; is it not?

8 A. I'm not really certain that
9 science -- I mean, I was a field scientist and my
10 research was in the field and I don't feel that one can
11 differentiate and say that science is something that's
12 only done in a lab and under rigidly controlled
13 conditions, and basically he says a measurable goal is
14 chosen for management. Now, I would consider that goal
15 being the hypotheses.

16 Q. The goal being the hypotheses?

17 A. He says a goal for management, he
18 doesn't say a management system is chosen.

19 Q. But are you saying the goal is the
20 hypotheses?

21 A. The goal --

22 Q. Is not the cause/effect linkage the
23 hypothesis, Dr. Eedy?

24 A. The goal is -- okay, the goal is the
25 result of the hypotheses, the management is the system

1 that get one there. The action that's stated in
2 Section 4, I don't see that that has to be defined as
3 management. I think we are arguing over words which --

4 Q. All right. Well, let's take a step
5 back then. In terms of research -- well, perhaps it is
6 much easier. I will go through Dr. Baskerville's
7 paper, he deals with each of these systematically.

8 What you are saying right now is that
9 from your point of view you see adaptive management, at
10 least at this point, as applying not to using the
11 management action as the experiment, but rather some
12 other type of research supporting the adaptive
13 management approach?

14 A. I see adaptive management as applying
15 to either whether you define it as a management
16 proposal, as your hypotheses, or whether you define
17 something else as your hypotheses. I see it as being a
18 system of applying rigid scientific criteria and an
19 iterative test program which feeds the results back
20 into your original hypotheses.

21 Whether you call that hypotheses,
22 management system or just a hypotheses or somebody's
23 theory or whatever, you know, I don't think that's
24 critical to the concept of adaptive management.

25 Q. Let us -- I would like to get some of

1 your comments on Exhibit 979 at this point, then. This
2 is the paper that Dean Baskerville prepared on
3 cumulative environmental impact assessment and it was
4 in proceedings dealing with research on this subject;
5 was it not?

6 A. My version doesn't say where it came
7 from.

8 Q. Would you not agree that the major
9 thrust of this whole paper is talking about undertaking
10 effective research on cumulative environmental impact
11 assessment?

12 A. That's correct, again, on the
13 labeling perspective. If one were to agree with Dr.
14 Baskerville's approach or his comments here, one would
15 say we should be now having a cumulative assessment
16 panel because he basically says environmental
17 assessment is something that's passe and is, as he
18 defines it, a toy/toy approach.

19 I don't agree with that. I feel that's
20 labeling that he has put on it and I feel that
21 cumulative assessment is something that environmental
22 assessment has evolved into and is part of
23 environmental assessment, the way it should and has to
24 be practised.

25 Q. Dr. Eedy, where it this paper does

1 Dr. Baskerville say that environmental assessment is
2 passe? Tell me the page, please?

3 A. Okay, I get this indirectly from page
4 13:

5 "Our current techniques effective in
6 CIA..."

7 Q. Yes.

8 A. He is basically saying:

9 "These techniques are not rigorous
10 science and inevitably result in great
11 confusion in the environmental impact
12 assessment process."

13 Q. Let's Stop right there. He doesn't
14 say environmental impact assessment process is passe,
15 he says the means by which we undertake impact
16 prediction is passee. Is that not what he is saying?

17 A. That's...

18 Q. It's the techniques that he is
19 concerned about, it's not the process; is it?

20 A. I don't -- I mean, if the techniques
21 are part of the process -- I mean, I guess we are
22 arguing over words again.

23 Q. Fine. Let's go through it
24 progressively then.

25 A. I guess what I'm basically saying,

1 and probably I'm sure you don't disagree with it, is
2 that the environmental assessment process, as I
3 understand it today, and as I certainly feel the Board
4 is -- I won't put words in your mouths, but I feel you
5 probably understand that it does include cumulative
6 assessment approach and not just looking at things
7 totally in isolation, and I feel what he is saying.

8 Whether he is saying that it used to be
9 or some techniques or the process or whatever, that's
10 what he is saying.

11 Q. Dr. Eedy, this paper deals
12 specifically with terrestrial systems, does it not, as
13 opposed to aquatic systems?

14 If you look at the first paragraph, the
15 first sentence, is that not the major thrust of this
16 with whole paper?

17 A. That's the major thrust, yes.

18 Q. And he indicates that in his view
19 terrestrial systems tend to be more highly variable in
20 nature as compared to aquatic system. Would you agree
21 with this?

22 A. That's what he says.

23 Q. I asked you if you would agree with
24 it.

25 A. I'm not certain. I'm not truly an

1 expert on aquatic systems.

2 Q. Well, perhaps I will ask Dr. Schiefer
3 also. Dr. Schiefer, based upon your knowledge of
4 aquatic systems and of terrestrial systems, would you
5 agree that there is generally a greater number of
6 species involved, greater temporal and geographic
7 variation, less well defined boundaries, whole variety
8 of factors like that that make terrestrial systems more
9 difficult to predict, more variable than aquatic
10 systems?

11 DR. SCHIEFER: A. Mr. Hanna, it is
12 somewhat of a generalization. For instance, in more
13 tropical aquatic systems, in fact you will find species
14 composition, eco-system complexity that rivals
15 terrestrial systems, but your generalization is
16 probably valid in the area of the undertaking as a
17 generalization.

18 Q. It is generalization I am dealing
19 with at this time, Dr. Schiefer.

20 Now, Dr. Eedy, he indicates that the
21 variabilities pronounced in both the geographic and
22 temporal dimensions and if you fail to recognize the
23 variability, scientific research has a potential of
24 becoming either, (1), anecdotal or, (2), trivial.

25 Do you agree with that view?

1 DR. EEDY: A. I would agree that that is
2 a potential problem in that area, yes.

3 Q. And so it is an important thing, in
4 fact it is a critical thing in developing research,
5 particularly research of the nature we are talking
6 about in this hearing?

7 A. That one considers the variability in
8 the system?

9 Q. Absolutely, and that one deals with
10 the geographic and temporal dimension that he goes in
11 detail in this paper about?

12 A. I think it's certainly critical to
13 look at these aspects.

14 Q. Looking at page 9 under heading The
15 Problem, Dean Baskerville sets out in the first
16 paragraph his concept of impact assessment, and I take
17 it you would agree with the view he presents here, that
18 it's basically a forecast of impact and there's always
19 the choice between two or more forecasts?

20 A. I would agree on that. I would --
21 you know, again, I think my testimony is on wildlife
22 assessment, not on impact assessment per se.

23 Q. Well, Dr. Eedy, just stopping right
24 there. I'm talking strictly about wildlife impact
25 assessment, okay. If I use the term environmental

1 assessment, I am really saying wildlife assessment,
2 okay, and I'm dealing strictly in those terms.

3 A. That's fine.

4 Q. So you still agree?

5 A. Yes.

6 Q. Now, in the other -- the last section
7 on that page under Designing Quality Research, Dean
8 Baskerville lists three critical issues that must be
9 adequately addressed in developing sound cumulative
10 impact research and they are -- and I will list them
11 here. You will see they correspond to paragraphs on
12 page 10 in the left-hand column and I have just
13 summarized each one for the interest of time.

14 The first important thing that has to be
15 considered is the level of resolution or units of
16 subdivision; the second thing is the time horizon and
17 size of the time step; and the third is the important
18 variables that need to be used to characterize the
19 natural system.

20 As a scientist, would you agree that
21 there are essential issues to consider in developing a
22 sound research program?

23 A. I would agree they're important
24 issues, yes.

25 Q. Now, on page 10 in the right-hand

1 column he's talking about the impacts of acid rain, and
2 if we go down to the first - or the second paragraph
3 there, in about the middle of it, he says:

4 "The classic research approach would be
5 to match several geographic areas and set
6 up sampling systems appropriate to the
7 agreed bounding..." and the bounding he
8 is referring to there are the things we've talked
9 about, times and space; correct?

10 A. Yes.

11 Q. "...the acid rain would then be
12 shut off for one half of the areas and
13 the sampling continued to provide the
14 classic comparative experiment amenable
15 to statistical analysis. Obviously this
16 is not possible. However, a close
17 variant is attempted when areas with
18 different acid loadings are used to mimic
19 the treatments. Note that in either of
20 these cases the two treatments are (1),
21 in different geographic areas; (2),
22 different plant communities; (3),
23 different soils; (4), different local
24 climates; (5), perhaps different times;
25 and (6), different acid loadings. We can

1 rationalize that the differences are
2 small, but the comparisons are there. It
3 is not surprising that attempts to
4 approach the problem at this scale have
5 Wallowed in ambiguity."

6 In undertaking the moose monitoring study
7 proposed by the Ministry, are not similar types of
8 constraints present in terms of different geographic
9 areas, different plant communities, different soils,
10 different local climates, different times, different
11 timber management practices of equal or greater
12 significance as the example he uses here with acid
13 rain?

14 A. First off, I am not an expert on acid
15 rain and I would not comment as to whether these are
16 equal or greater differences. I do agree that there
17 are geographic differences across the province and that
18 these could have some effect on the overall study
19 program.

20 Q. Do you have -- do we not have an
21 additional confounding variable with the moose study in
22 that the guidelines are not applied evenly or
23 consistently over the area of the undertaking?

24 A. Again, if one were to take an affects
25 monitoring program, I think there would have to be some

1 rigid definition of how the guidelines were going to be
2 applied in each of the research areas, whether that is
3 occurring now or not. I don't think -- you know, I
4 think that that step would have to be part of the -- if
5 one were to approach this in a scientific manner.

6 Q. Is that a yes?

7 MR. CASSIDY: Well, that's his answer.

8 MR. HANNA: No, I want to know whether
9 that was a yes or no.

10 Q. Do we have an additional confounding
11 variable in that the guidelines are not evenly
12 distributed over the area of the undertaking?

13 DR. EEDY: A. I don't think one can
14 compare how the guidelines are operated now with how
15 they would be operated if one were to instigate the
16 monitoring program.

17 Q. Is not the moose monitoring study
18 designed exactly according to the classic research
19 approach castigated in this paragraph by Dean
20 Baskerville? It involves a comparison of areas in
21 which the guidelines have been applied and not been
22 applied; is that correct?

23 A. That's correct.

24 Q. And that's exactly what Dean
25 Baskerville is criticizing here?

1 A. Again, I gather -- I'm not sure that
2 the acid rain example and the moose example are
3 directly comparable. It certainly is similar to what
4 he is commenting on in that paragraph.

5 Q. Dr. Eedy, I am just going to give you
6 this for the interest of time. This is just out of the
7 Panel 16 witness statement. (handed)

8 MADAM CHAIR: Thank you, Mr. Hanna.
9 These are pages 463 and 464?

10 MR. HANNA: Yes, Madam Chair.

11 MADAM CHAIR: Out of MNR's witness panel
12 16?

13 MR. HANNA: Yes, Madam Chair.

14 Q. Dr. Eedy, are you familiar -- these
15 are the pages from the Panel 16 witness statement.

16 Yesterday I asked you if you had looked
17 at the Panel 6 (sic) witness statement and you said you
18 had. This is the general description of how that will
19 be implemented; is it not?

20 DR. EEDY: A. Yes.

21 Q. Looking first at the point two under
22 the General Approach:

23 "...demonstration that use by moose of
24 habitat in guideline areas is different
25 than uses by moose of habitat in

1 non-guidelines areas."

2 A classic research approach; is it not?

3 A. It's -- I'm not sure that point two
4 is an approach, it's an objective of a research
5 program.

6 Q. The general approach involves radio
7 tagging a number of moose in a variety of
8 environments, describing their habitat in
9 detail and examining their use of habitat
10 and their conditions. It contains four
11 parts."

12 Does not 'it' refer to the general
13 approach?

14 A. I gather it does, yes.

15 Q. So they're not objectives, it is the
16 general approach?

17 A. Yes.

18 Q. Turning now to page 5 -- I'm sorry,
19 464, the second full paragraph there. They talk about
20 the critical factor and the success of this program,
21 the need to categorize the habitat and the
22 categorization they list is unlogged areas, areas
23 logged without moose timber management guidelines,
24 areas logged with moose timber management guidelines
25 and unlogged landscapes that resemble areas logged with

1 timber management guidelines. Again, a classical
2 approach; is it not?

3 A. Yes.

4 Q. Do you agree also that the impacts of
5 timber management on moose is a classic example of the
6 cumulative impact phenomenon being described by Dean
7 Baskerville?

8 A. It certainly is an example.

9 Q. On the top of page 11, turning back
10 to Exhibit 979, Dean Baskerville concludes that:

11 "This example..." and again he is
12 talking about the acid rain example, but I think, will
13 you agree, that there are similarities from an
14 cumulative impact point of view in terms of this
15 example and the moose population example? Can we use
16 that as the example in the remainder of this?

17 A. Go ahead.

18 Q. Is that acceptable to you?

19 A. That's acceptable.

20 Q. "This example illustrates the single
21 biggest problem with research and
22 cumulative impact assessment or in
23 research management. Due to the spacial
24 and temporal scales involved, we can
25 never truly do rigorous scientific work

1 with the real subject of interest."

2 Do you disagree with that?

3 A. No, I don't. I think that is
4 certainly something I was bringing up the other day
5 that when one does research one's working with
6 populations, not the whole -- you know, everything. I
7 presume that's what he means.

8 Q. And that's one of the difficulties in
9 trying to do local site specific studies, is it not,
10 that you have to deal with populations, you have to
11 deal with the geographic and temporal variation that
12 Dean Baskerville brings out so clearly in this paper?

13 A. It is one of the difficulties, yes.

14 Q. Now turning over to page 12, the
15 left-hand column, the second full paragraph:

16 "A third form of cumulative impact or
17 impacts are those which accumulate by
18 cycling over geographic space and time.
19 An example here might be clearcutting
20 in forests. Each time a portion of the
21 forest is clearcut, it adds to the total
22 of cut-over area. However, cut-overs are
23 not static things, they will always
24 recover, although not necessarily to
25 the right species. Thus, over time there

1 is a dynamic balance between annual
2 addition to the total of cut-over by
3 harvesting and annual removals by plant
4 succession. The effect is that the
5 impact of clearcutting migrates across
6 the geographic area through time."

7 Would you agree that since wildlife
8 habitat is controlled largely by the forest structure,
9 that wildlife habitat impacts of timber management
10 clearly fall within this third form of cumulative
11 impact described by Dean Baskerville?

12 A. It has certainly been -- you know,
13 that's center to the whole thing that we've been saying
14 in our witness statement, that these impacts are
15 dynamic and they move across the area of the
16 undertaking with time as the forest renews itself and
17 recovers and matures.

18 Q. And looking now at the bottom of that
19 column on page 12, the sentence that carries over to
20 the top of the next column:

21 "While environmental impact assessment of
22 herbicides has traditionally concentrated
23 on the local impact on a single hectare
24 or a few square metres, an accumulating
25 impact results from the fact that the

1 herbicides alter the successional pattern
2 over time where they are used and that
3 the location of their use migrates over
4 the geographic area through time."

5 Has your analysis in Section 3 of your
6 witness statement examined cumulative impacts of
7 herbicides within this type of space and time concept?

8 A. It certainly looked at it, yes.
9 Again, that's one of the -- again, concepts of our
10 conclusions is that these impacts do migrate with time
11 and that areas recover after they occur and it becomes
12 part of the whole rotation of habitat production.

13 Q. So from your point of view, then,
14 that cumulative environmental impact of herbicides is
15 an important issue?

16 A. It's an important research topic. My
17 conclusion was from a wildlife perspective, that it
18 wasn't a significant impact.

19 Q. Without having done any research?

20 A. Having basically done literature
21 review, not having done actual field research.

22 Q. And you are familiar with literature
23 that projects over time and space, comparable to the
24 area of the undertaking, the impacts of herbicide and
25 wildlife impacts?

1 A. I'm familiar with literature that
2 looks at impacts over time.

3 Q. For example?

4 A. Well, I think the literature that
5 we've looked in the--

6 Q. The Newton study?

7 A. --section 3. I would have to...

8 Q. I want to deal with Section 3 in a
9 moment, I will come back to that.

10 Continuing on with the moose monitoring
11 program for the time being. Looking at the last part
12 of the paragraph in the right-hand column before the
13 heading, about two-thirds of the way down, Dr.
14 Baskerville says:

15 "In the case of an impact which becomes
16 embedded in the system structure or
17 system dynamics and then accumulates
18 within the system, conventional
19 approaches to environmental impact
20 research would fail to detect or forecast
21 a problem. Impacts which accumulate
22 literally within the system itself could
23 very easily go unnoticed with
24 conventional approaches to environmental
25 impact assessment since these tend to

1 emphasize overall appearance of a system,
2 rather than the internal structure. The
3 key here is to get an appropriate choice
4 of indicators and measures. Finally,
5 conventional research approaches which
6 concentrate on local effects or local
7 impacts will completely miss the
8 accumulative impacts like clearcutting
9 which cycle over geographic space through
10 time."

11 Does not the proposed moose monitoring
12 program suffer from many of the exact pitfalls that
13 Dean Baskerville is outlining here?

14 A. Some of them it would. I don't -- on
15 on some of them I'm not certain that it is spelled out
16 in that detail and in others it certainly has the
17 potential for defining measurable issues.

18 Q. Is not a primary argument for the
19 adaptive management approach to wildlife impacts of
20 timber management the need to cope with the great
21 geographic and temporal variability over which timber
22 management takes place in this province?

23 A. Those are topics which are certainly
24 discussed in this paper on cumulative environmental
25 impact assessment. I'm not sure that this paper

1 directly refers to adaptive management.

2 Q. This question was to you as a
3 wildlife scientist, Dr. Eedy, and I will read to you
4 again. Forget about the paper, I am asking you.

5 Is not a primary argument for the
6 adaptive management approach to wildlife impacts of
7 timber management the need to cope with the great
8 geographic and temporal variability over which timber
9 management takes place in this province?

10 A. I certainly feel that the geographic
11 and temporal variability are things that require
12 investigation and definition within an adaptive
13 management or a scientific approach. I don't think
14 that they're the overall limiting factors and --

15 Q. The overall limiting factors to what?

16 A. To research.

17 Q. What is the overall limiting factor?

18 A. Well, I think that one has to look at
19 basically all of the kind of factors involved. One
20 can -- I know it's very difficult in any kind of
21 research to determine exactly what climatic or temporal
22 or other factor is the overall riding factor which
23 determines what the result is, and I think one has to
24 consider as many of these things as is possible.

25 Q. And that's one of the strengths of

1 the adaptive management approach, is that by having a
2 large number of replicates over a large area and
3 accumulating knowledge over time, that many of those
4 problems can be addressed?

5 A. Again, you know, this is basically
6 saying that research should continue on over time. I
7 can't argue with that because I think the more research
8 is done the greater our knowledge is and I don't...

9 Q. Dr. Eedy, I have to come back.
10 Listen, there is a very clear distinction I am trying
11 to make here and the distinction is this: One is, I
12 can take a study as I've just shown you that the
13 Ministry is proposing in terms of moose monitoring and
14 I can pick a set of study areas and I can intensely
15 monitoring those.

16 The other option is to extensively
17 undertake the action and monitor over a broad area
18 through the management intervention itself.

19 Do you see those two distinctions,
20 because that's the important thing in everything that I
21 am talking today about? There's two ways to skin the
22 cat; do you see that?

23 A. I guess what I fail to see is where,
24 if one is using moose guidelines or some other system,
25 that this can't be applied on a broader and local

1 scale.

2 Q. Let's not worry about moose
3 guidelines or other systems, let's just talk about this
4 from a scientific research point of view, dealing with
5 the time and space problems that Dean Baskerville
6 articulates so clearly in this paper.

7 Now, there is two ways to come about
8 that. One is what he calls a classic research
9 approach, which is to take your study area, radio tag
10 your moose, monitor those moose and try to extrapolate
11 to the total area of the undertaking.

12 MR. FREIDIN: He doesn't say that.

13 MR. HANNA: That's one -- I didn't say
14 Dean Baskerville said that.

15 MR. FREIDIN: All right.

16 MR. HANNA: Q. That's one way to
17 approach the problem; isn't it?

18 DR. EEDY: A. Yes.

19 Q. And another way to approach the
20 problem is to take a whole variety of management
21 actions across a whole broad area and accumulate that
22 extensive knowledge and attempt to derive something --
23 to do something from that knowledge as opposed to an
24 intensive study on a set of local areas. Is that not
25 another alternative?

1 A. I guess what I'm having the problem
2 with is that I think there are a whole broad range of
3 alternatives, and whether one intensively studies one
4 area, intensively studies ten areas or a hundred areas
5 or a thousand areas, I think depends a lot on the time
6 and manpower and costs and whatever else that one has
7 available.

8 And I think as a scientist I have to
9 agree, that the more money and the more manpower and
10 the more time when one looks at the problem, the
11 quicker and better the resolution would be.

12 I don't think it's my position to say
13 that, you know, all of the money in manpower should be
14 thrown at this problem or at some other problem. I
15 think that's really a policy decision and that perhaps
16 somewhere between trying to study every moose in the
17 whole province at the same time and under a whole
18 variety of management scenarios and studying one area
19 only under one management scenario would be best, but I
20 am not -- I don't want to be tied down to saying
21 exactly where that cut off is.

22 Q. Dr. Eedy, I did not suggest to you
23 that the budget for the study will be changed in any
24 way whatsoever. I said I have a fixed budget,
25 \$20-million or whatever the number is and I have two

1 ways to allocate that money. Now, taking that as the
2 assumption, do you see the two possibilities I am
3 putting out to you?

4 A. Yes. If the same amount of money
5 were spent and one were to study either the broader
6 area or the smaller area, I guess one would have to
7 vary the number of parameters that one was studying.

8 Q. Or the intensity with which you study
9 them?

10 A. Or the intensity of which you study
11 them. And I guess, again, I have difficulties because
12 I think you would have to define this a little more
13 rigidly because there is a point in which you could
14 become very superficial and look at the broad area and
15 come up with conclusions that you don't have too much
16 faith in, as compared to being overly excessive in
17 studying a small area and coming up with a way more
18 detail than you need to come to a reasonable
19 conclusion.

20 Q. And is not the argument that Dean
21 Baskerville's putting out in this paper that, given the
22 temporal and spacial variation that you deal with,
23 particularly with cumulative impacts such as forest
24 management, that it is extremely difficult, in fact you
25 wallow in ambiguity when you try to pick those local

1 intensively studied areas and try to extrapolate to
2 broad other areas, for all the reasons he lays out in
3 this paper?

4 You are familiar with the extrapolation
5 issue? It is not a new issue for you; is it?

6 A. Yes. Again, I think there is a point
7 at which you have to extrapolate because you are never
8 going to be able to study the whole of everything, and
9 I think he says that in his paper as well because
10 basically when we talk about this toy/toy, toy/real
11 and real/real study, he basically says the real/real
12 study is a position that one will never reach.

13 I agree with him that the further one
14 goes towards that the better in absolute scientific
15 terms.

16 Q. Now, Dr. Eedy, if we had a habitat
17 supply analysis approach to managing moose in this
18 province at the present time and other wildlife
19 species, that would by its very nature define the
20 parameters that we need to monitor; would it not?

21 It would be those parameters that were at
22 least used in the predictive system?

23 A. It would be those parameters that
24 whoever has put the model together has decided are most
25 important, yes.

1 Q. And depending upon the nature of
2 those, if those were things that could be detected from
3 remote sensing, from standard forest inventories, et
4 cetera, that type of information might be quite
5 economical to achieve; wouldn't it?

6 A. Certainly.

7 Q. So that you might be able to take
8 that budget that you use for a very intensive detailed
9 study and, in fact, be able to do some pretty
10 reasonable research at a very broad and extensive area?

11 A. Yes.

12 Q. Now, back to the point I was asking
13 before. Is not a primary argument for the adaptive
14 management approach to wildlife impacts the need to
15 cope with the great geographic and temporal variability
16 over which timber management takes place in the
17 province?

18 A. That would be a conclusion from
19 Baskerville's recommendations, yes.

20 Q. And you would agree with that?

21 A. I think that in order to deal with
22 the broad area that, yes, one has to definitely look at
23 geographic variation.

24 Q. Does the adaptive management approach
25 not recognize that management actions will be taken

1 while time profile information becomes available?

2 A. Yes, it's a feedback system.

3 Q. And that we have to make best use of
4 the information we have at the present time but, by the
5 same token, we are able to accumulate -- that time
6 profile information so critical in scientific research;
7 isn't it?

8 A. Well, certainly it's the whole point.
9 One doesn't stop now and say we have the absolutely
10 perfect system and we are never to going to change it.
11 One has to allow this flexibility for feedback as
12 results become available to continually improve the
13 system.

14 Q. Now, let's us look back to the paper
15 on page 12 under the heading Do These Issues Vary with
16 the Scale of the Problem. I am looking at the second
17 sentence there:

18 "Regardless of the scale of the problem,
19 impact assessment to be scientifically
20 rigorous..." And I believe that's a
21 principle that you endorse, "...must provide an
22 explicitly based forecast of system
23 performance without intervention and
24 an explicitly based forecast of system
25 performance with intervention."

1 Now, have we not concluded yesterday that
2 the guideline approach is a subjective manual
3 assessment? That was your evidence; wasn't it?

4 A. I'm not sure that it's an assessment,
5 it's a subjective management system. The effectiveness
6 monitoring program I don't believe is subjective..

7 Q. I didn't ask you about the monitoring
8 program, I asked you about the guidelines and, we
9 agreed yesterday, reading one of your colleagues in
10 Beak's paper dealing with subjective manual
11 assessments, that in fact the guidelines fell within
12 that type of approach; is that not right?

13 A. I mean, the guidelines have in
14 there -- when the guidelines were determined they were
15 based on objective research, as well as opinions of
16 scientists who work with moose and other things like
17 that. I mean, I'm not --

18 Q. Dr. Eedy, with the greatest respect,
19 I simply asked you what you said yesterday. Did you
20 not say yesterday that the guidelines were a form of
21 subjective manual assessment?

22 A. I think what I agreed to yesterday,
23 and I would have look at Dr. Kansas' paper.

24 Q. It is on page 12 -- or on page 129,
25 bottom the of the page.

1 MR. CASSIDY: Exhibit 1258.

2 DR. EEDY: Which page is this on again?

3 MR. HANNA: Q. 129 at the bottom of the
4 page in the right-hand column.

5 DR. EEDY: A. I guess, as he describes
6 it as a subjective rating program, I think that that
7 has to be clarified in that subjective knowledge of the
8 scientists involved in his description certainly would
9 include objective research.

10 Q. No question, I'm not --

11 A. I don't want to imply that the
12 guidelines were put together by people who just sat
13 down over a cup of coffee and decided how they would be
14 done without any consideration of the volume of
15 research that has been done and results available.

16 Q. I have never made that suggestion in
17 this hearing and I never will and I didn't not in any
18 way infer that to you yesterday.

19 A. Yeah --

20 Q. I agreed with you it was based upon
21 scientific -- or best knowledge that the Ministry had.
22 It was matter of how the knowledge was put together.

23 A. I think it is just Dr. Kansas' use of
24 the word subjective that I wanted to qualify.

25 Q. Now that you have seen how he is

1 using the word, will you agree that that is what you
2 said yesterday and will you agree today that the
3 guidelines fall within the general flavour of what he
4 is describing here as a subjective manual assessment
5 procedure?

6 MR. FREIDIN: I think he indicated it was
7 more closely akin to that than it was to the other
8 description of assessments, Mr. Hanna.

9 MR. HANNA: Q. Would you agree that it
10 falls within this realm?

11 DR. EEDY: A. Yes. Again, I would
12 qualify that I'm not sure that the guidelines
13 themselves are an assessment method. The guidelines
14 are more of a management method.

15 Q. Okay. Now, let's go back to where we
16 got on this rather extensive tangent and that was this
17 quote from Dr. Baskerville's paper on page 12, Exhibit
18 979 and he is talking -- I won't read it again, but he
19 is dealing with this need to have explicitly based
20 forecast of system performance. That's the essence in
21 his view of being able to do scientifically valid and
22 rigorous research. Now, do you agree with that?

23 A. I agree with that, yes, that's your
24 hypothesis.

25 Q. How can we establish that the moose

1 guidelines do or do not provide system performance when
2 we don't have an explicitly based forecast?

3 How can we test that? How can we
4 undertake scientifically rigorous research, looking
5 specifically at Dr. Baskerville's view here?

6 A. I'm not certain that we don't have a
7 hypothesis which can be tested on this -- I guess it
8 was Panel 16 document with the four points, four parts
9 of the general approach.

10 It states that this is assuming -- or I
11 would assume that these four points there that they are
12 propose to demonstrate are all based on hypotheses to
13 demonstrate that -- the second point:

14 "...to demonstrate that the use by moose
15 of habitat in guidelines areas is
16 different than the use by moose of
17 habitat in non-guidelines areas."

18 I mean, this to see to me is something
19 that is testable, that one does the research in the two
20 areas and compares them, and if there are different
21 numbers of moose and they are using the habitat
22 differently, that proves the hypothesis.

23 Q. Dr. Eedy, using your own colleague in
24 Beak's words:

25 "Subjective evaluations have a

1 limitation of not being repeatable, of
2 incorporating selective individual biases
3 and not being available for scrutiny by
4 others."

5 He is saying they're implicit, that the
6 hypotheses, the relationships, the whole discussion we
7 had yesterday with the problem with implicit
8 relationships is they aren't testable.

9 Now, how can you possibly test something
10 that's not explicit?

11 A. I don't see that that isn't explicit.
12 I mean, one can go into two areas and count the moose
13 and if there was 500 moose in one and ten in the
14 others, there's an explicit difference between those
15 two areas and the hypothesis that there is a difference
16 is proven.

17 Q. So we've tested the hypothesis for
18 the one biologist, the relational model he had in his
19 head when those guidelines were applied on that
20 specific piece of land. What about the models that all
21 the other biologists have in their heads, how are we
22 going to test those?

23 A. I mean, I'm not sure where you're
24 getting at.

25 Q. We've talked yesterday about the fact

1 that to use the guideline approach, the subjective
2 manual assessment approach that your colleague in Beak
3 describes, each biologist must have in his mind an HSA,
4 but there is no guarantee that it will be the same HSA
5 among all biologists. We agreed to that; didn't we?

6 A. That's true.

7 Q. So if we want to test those models
8 because now we have got a whole plethora of models out
9 there, we have to test each one of those biologist's
10 models?

11 A. I mean, the guidelines in my view are
12 basically a verbal model of what the Ministry has felt
13 is important in wildlife habitat.

14 I guess what my problem is, in saying
15 that I really cannot come to the conclusion that they
16 are wrong and that other -- somebody else's HSA model
17 is right. The alternative, I'm not saying that the
18 U.S. forestry service or the Alberta moose model or
19 maybe one that Dean Baskerville has put together in New
20 Brunswick are wrong either.

21 I don't think I have ever said that one
22 is -- that's what I am trying to avoid saying, is that
23 one is all wrong and one is all right. Maybe there are
24 different ones that are better or worse, I don't
25 disagree with that.

1 Q. Let's take one of the key themes that
2 the forest Industry has put forward in their evidence
3 to this point and that's need for flexibility.

4 Let's take the situation that in fact we
5 carry through with the moose monitoring program as it's
6 currently proposed, and let's say through the study
7 design that, for all intents and purposes, we develop a
8 habitat analysis for that one biologist or those two or
9 three biologists for which the study areas apply and we
10 test it, we use very intensive scientific methods and
11 test it, we come to very specific specifications in
12 terms of developing adequate moose habitat.

13 How would it be possible to argue against
14 applying that stringently and rigidly across the
15 remainder of the undertaking? You wouldn't have any
16 other basis to argue it. The only scientific basis you
17 would have is those few local studies. You would --
18 that would remove the flexibility that you are arguing
19 for; would it not?

20 A. Again, I feel from what I have seen
21 or interpreted of the moose guidelines and the
22 application that there is flexibility involved, and I
23 would certainly hope that if that was one choice or the
24 choice, I would hope that the flexibility exists to
25 monitor the effectiveness and to utilize this

1 monitoring to improve the system and to apply it on a
2 site-specific basis.

3 Q. Can we turn to page 13 of Exhibit
4 979, the right-hand column at the top. In the middle
5 of that part paragraph, Dean Baskerville says:

6 "On the other hand, if impacts on the
7 biological system are accumulating as a
8 result of some cycling insult such as
9 clearcutting, then there is a need for a
10 wide geographical area to be considered
11 and with a fine resolution of area within
12 that total in order to detect, forecast
13 and forecast the relevant system
14 dynamics."

15 Now do you agree with that?

16 A. I don't know. It is beginning to
17 sound a little repetition, but I think I said before
18 that, you know, we are looking at a broad area and the
19 more geographically we can apply any effectiveness
20 monitoring the better the results.

21 Q. But the point he's --

22 A. I think this is really a
23 determination of, you know, how much dollars and
24 manpower we can apply to it, which is not something
25 that I want to really make as a policy decision.

1 Q. But does this not argue for a large
2 number of replicates across a large area in terms of
3 evaluating the effects of timber management on moose
4 populations? Is that not the message he is giving us
5 here?

6 A. I think the messages he is giving us
7 is that as a scientist the more research one can do the
8 better one has confidence in the results.

9 Q. But he is saying that there is a need
10 for wide geographical area to be considered with a fine
11 level of resolution. He is not saying here that we
12 need to -- he is not saying open the money doors and
13 let the money flow, he is saying: The limited money
14 you have, researchers, use it in such a way that it
15 will give you results that are meaningful in terms of
16 the problem you are addressing.

17 Isn't that what he's saying?

18 A. Again, as I think I said about 15, 20
19 minute ago, you know, there has to be some decision as
20 to whether one does intensive research on a small area
21 or fairly superficial research, picking key indicators
22 or something like that over a broad area, and I feel
23 that from a scientific perspective probably somewhere
24 inbetween would be best, assuming that there is a
25 somewhat limited amount -- or the same amount of money

1 and manpower to throw at it.

2 Q. And it's your viewer that the moose
3 monitoring program as currently proposed is that good
4 inbetween? Have you looked at other ways to use that
5 money from a research point of view, Dr. Eedy?

6 A. I am certain that there are a number
7 of ways and I don't really think that -- you know, I
8 have some thoughts I guess as to which one way might be
9 better or worse, but I don't think there is an absolute
10 right and wrong.

11 Q. And what are your thoughts?

12 A. Well, I think that -- again, I don't
13 know the dollars and cents and manpower, but I do feel
14 that there should be some geographic variability in the
15 work that's done, but I wouldn't apply sort of an
16 absolute to that term.

17 Q. By using the adaptive management
18 procedure as a research approach, does one not, in
19 essence, obtain a great number of replicates for a wide
20 variety of cases?

21 A. Well, I mean, that's true, that the
22 temporal and spacial aspects of that again would have
23 to be something defined on a case basis.

24 Q. Is not possible, seeing that the
25 adaptive management approach is applied at the point at

1 which the individual management actions take place,
2 that a fine level of resolution can be achieved in
3 terms of the forest structure?

4 A. I think that's a fairly broad
5 statement. I'm not -- you know, I can see within
6 adaptive management approach or a scientific approach.
7 How broad the application and that sort of thing is
8 really -- you know, it's hard to give very general
9 conclusions of that nature.

10 Q. Looking under the heading Our Current
11 Techniques Effective in CIA, on page 13, the bottom of
12 the page, he says:

13 "In some techniques, this
14 characterization..." the
15 characterization being the system -- the forecasting
16 system performance, "...is implicit and, therefore,
17 easily accessible to the reviewer, nor
18 scientifically rigorous."

19 He goes on and explains in the latter
20 part of that paragraph the behaviour response to that
21 type of concern and he concludes that the -- continuing
22 on to the next paragraph, the first page, he says:

23 "Explicitness of system relationships
24 used in forecast becomes crucial in
25 bridging from the toy problem used for

1 research to the rigorous scientific
2 analysis at the real problem level."

3 So you would agree that this is a key
4 issue to make explicit those relationships?

5 A. I would agree to the more explicit
6 one is in the hypotheses the easier it is to test them,
7 and if hypothesis are not explicit they are difficult
8 to test.

9 Q. Right. And as a scientist would you
10 not agree that the hypothesis that you would want to
11 put forward in terms of moose would be the relationship
12 between key habitat variables and the moose population?

13 A. I certainly think that's a good
14 starting point, yes.

15 Q. And that's the essence of the habitat
16 supply analysis approach; isn't it?

17 A. Yes.

18 MADAM CHAIR: Mr. Hanna, in your case,
19 will you be bringing evidence before the Board on
20 specific examples; for instance, we are looking now at
21 the proposed effectiveness monitoring of moose
22 guidelines and we understand your client's criticisms
23 of the way that that's being proposed by the Ministry,
24 in your evidence will you be bringing concrete examples
25 of how an alternative study approach could be used--

1 MR. HANNA: Yes.

2 MADAM CHAIR: --with adaptive management
3 techniques and habitat supply analysis and not
4 completely theoretically, but with examples of how you
5 would see it being carried out?

6 MR. HANNA: Madam Chair, I have
7 anticipated your question over the course of this
8 hearing. I certainly appreciate the Board's desire to
9 have concrete examples, not theoretical examples of --
10 it is one thing to criticize, it's another thing to
11 bring forward a concrete alternative.

12 I can tell you that my client is using
13 the limited resources they have in every conceivable
14 way to bring forward to you as concrete examples as
15 possible of how this could be implemented in such a
16 way -- in as close a form to being, I will call it,
17 turnkey as possible and I certainly am making every
18 effort in that way and hopefully my words will be
19 borne out by our evidence.

20 MADAM CHAIR: Thank you, Mr. Hanna.

21 MR. MARTEL: Is this being worked in
22 other places, though, extensively so that you do have
23 some results that you can show?

24 I mean, forget that you are not talking
25 about theory for the moment, but in fact you are

1 talking about how you want it to work, is that based on
2 examples elsewhere or how you foresee it working?

3 MR. HANNA: Part of the answer to that,
4 Mr. Martel, is -- I'm not a witness right now--

5 MR. MARTEL: No, I understand that.

6 MR. HANNA: --but a bad witness answer to
7 you, yes and no.

8 The yes is that it is being applied at
9 the present time, but because the concepts are
10 relatively new you can't look and say: Well, we've had
11 20 years of experience and it has been effective, but
12 it is certainly being used. There is no question about
13 that.

14 The no side is that -- my view is that
15 many of the things the Ministry is doing right now, for
16 all intent and purposes, is providing the input that's
17 needed to make the system applicable.

18 We aren't talking in my view, and this is
19 the evidence we will be bringing forward, is not
20 talking about a total revamping of the system; much of
21 that information is there, much of the knowledge is
22 there, it's a matter how to make best use of that
23 knowledge.

24 So that's the no side of it; in other
25 words, it's theoretical in a sense in that we haven't

1 got that long history but, yes, a lot of the
2 information, a lot of the pieces that we need are
3 there, it's simply a matter of structuring the system
4 in such a way that it's used efficiently. That's the
5 type of evidence we will be bringing forward.

6 MR. MARTEL: I guess what I am having
7 difficulty with is, if you are going to bring that
8 forward -- I might just say my own difficulty, is the
9 extent of argument that's been going on here about a
10 system when, in fact, you are going to present your own
11 case, as you seem to be trying to prove Baskerville at
12 the present time.

13 I'm not sure if that -- is that
14 beneficial to us if you are going to bring it yourself,
15 not in a way where you are asking questions and hoping
16 to elicit a response, but rather when you present it
17 yourself and say: Here is the way the lay of the land
18 is for us, and I'm not sure that this sort of -- I
19 don't speak for my colleague but for myself, I'm not
20 sure that's as beneficial as hearing the evidence
21 directly as here is how we would proceed.

22 MR. HANNA: I understand your concern,
23 Mr. Martel, and it isn't something that's again past by
24 me. Certainly the Board has indicated to me on
25 - numerous occasions: I will have my time in court to

1 present my case and whatever.

2 The only reason I've taken the time I
3 have and attempted to follow this in the detail I have
4 is that I have here a witness statement which endorses
5 a cornerstone of the Ministry's case that violates the
6 evidence I'm bringing forward, so I see it's important
7 that I test that information and I test the basis for
8 that conclusion.

9 I am hoping that through this line of
10 argument that either the witness will say: Oh, well, I
11 didn't really think about that; yes, I guess there is
12 some benefit in that; or at least the credibility of
13 the opinions that are brought forward are put into
14 doubt such that when the alternate ature evidence comes
15 forward the Board will have greater faith in that.

16 That's the reason I am pursuing it at
17 this time, because I am concerned about the basis upon
18 which that endorsement has been given.

19 MR. HANNA: Q. Dr. Eedy, I would like
20 now to move to the third part of the endorsement that
21 you've given and that is to term and condition 57 of
22 the Ministry of Natural Resources which is Exhibit 700.

23 This term and condition deals with the
24 population monitoring component of the Ministry's
25 proposal; is that correct?

1 DR. EEDY: A. That's correct.

2 Q. This is the part that deals with the
3 effectiveness of the featured species approach and the
4 associated guidelines to deal with other species?

5 A. Yes.

6 Q. And also those species that are not
7 covered by the guidelines?

8 A. Correct.

9 Q. Would you agree there is a
10 significant difference between monitoring and impact
11 prediction with respect to wildlife?

12 A. Certainly.

13 Q. Now, I'm looking at Exhibit 923 which
14 is the exhibit that you spoke so highly of throughout
15 your cross-examination with Mr. Lindgren. I am looking
16 particularly at page 2 of that.

17 A. What's the title of that one?

18 Q. Wildlife Habitat Inventory and
19 Population Monitoring Projects, 1989-90, authored by
20 Drs. Baker and Euler.

21 MR. CASSIDY: Exhibit 923, right?

22 MR. HANNA: 923, correct.

23 DR. EEDY: Sorry, I don't have it.

24 MADAM CHAIR: Is this a good time for a
25 break, Mr. Hanna--

1 MR. HANNA: Looks like it.

2 MADAM CHAIR: --while Dr. Eedy and the
3 Board find their Exhibit 923?

4 MR. HANNA: Certainly, Madam Chair.

5 MADAM CHAIR: We will be back in 20
6 minutes.

7 ---Recess taken at 10:20 a.m.

8 ---On resuming at 10:45 a.m.

9 MADAM CHAIR: Please be seated.

10 MR. HANNA: Q. Dr. Eedy, over the break
11 I provided you with a photocopy of my Exhibit 923. I
12 ask you not to look at the notes on the pages, and I
13 would like to obtain some of your views on this.

14 First of all, looking at page 1 -- or,
15 excuse me, page 2, which is the Wildlife Habitat
16 Inventory for Timber Management Plans. In this exhibit
17 and any of the other exhibits that you are aware of
18 there are no cause/effect linkages, specific bounding
19 of the impact relationships and many of the other key
20 needs that Dean Baskerville identified as key
21 essentials in cumulative impact assessment research; is
22 that correct?

23 A. I see these as being general
24 approaches to the research that would be implied, I
25 think, when they are applied. It says:

1 "...each of the northern regions surveys
2 were conducted..."

3 And I gather that includes some kind of
4 founding, but it isn't specifically founded, no.

5 Q. But a survey is a long ways from an
6 explicit cause/effect linkage, it is a long way from
7 defining what the time step is, it is a long way from
8 defining what the appropriate spacial resolution is in
9 terms of developing system performance forecast; isn't
10 it?

11 A. It's an initial step, yes.

12 Q. But it's a long ways to go to get to
13 the kind of rigorous scientific approach to cumulative
14 impact assessment that Dean Baskerville outlined in
15 Exhibit 979?

16 A. In a general sense. I guess a long
17 way is not a very specific definition of something.

18 Q. But you would agree as a scientist
19 there are some really fundamental issues that have to
20 be examined here that haven't been examined in the
21 information you have available to you at the present
22 time?

23 A. Is that a question or...

24 Q. It is.

25 A. Referring to this paper, I mean this

1 sets out a general program that -- it talks about a
2 number of research initiatives and, you know, I think
3 it is certainly heading in the right direction.

4 Q. The reason I am asking you these
5 questions is, you have endorsed this study approach and
6 I want to understand what it is you're endorsing and
7 why it is you're endorsing it?

8 A. Well, I think maybe if I could try to
9 clarify this and shorten it because we seem to be
10 coming back to the same question over and over.

11 What we have endorsed is, basically we
12 have endorsed an effectiveness monitoring program.
13 This does not mean that we don't feel -- in fact, I
14 very strongly, I feel, in the witness statement
15 endorsed habitat supply analysis as a very excellent
16 management tool.

17 The problem I think we are coming to is
18 that I'm not going to say that one method is inherently
19 wrong. I feel whether one applies either the guideline
20 approach, the habitat supply analysis or both, that
21 effectiveness monitoring as an iterative feedback
22 system is key to both and I don't think I can really go
23 beyond that.

24 Q. How does identifying, as an example,
25 the nesting areas of bald eagles deal with the type of

1 cumulative affects that Dean Baskerville speaks of,
2 such as clearcutting, which migrate across the
3 geographic area through time?

4 A. I think this is a different approach
5 in that identifying the nesting sites of bald eagles is
6 more of a constraint approach. In following the
7 guidelines, one would then allow protective measures to
8 protect those particular sites.

9 Q. But that doesn't deal with the whole
10 issue of temporal variability that Dean Baskerville is
11 talking about; the need to look not only of what exists
12 today but what exists in the future, how the system
13 will perform in terms of timber and wildlife?

14 A. It's not the impact predictive
15 approach, what it is is it's a mitigative measure which
16 is put in place to manage and prevent that impact from
17 occurring.

18 It makes an assumption that if one cut a
19 forest, including the tree that the bald eagle was
20 nesting in, that there would be a definite effect of
21 harvesting on the bald eagle and its nest.

22 Q. But that's a static mitigation?

23 A. That's a static mitigation.

24 MADAM CHAIR: It is certainly a course of
25 action that habitat-supply analysis wouldn't preclude.

1 MR. HANNA: Well, not all, Madam Chair.

2 I think the point I am raising with the witness is,
3 that may mitigate the today, may impact it for 15
4 years, when that trees falls down and if we haven't
5 looked into the future, we may not have another tree
6 for the bald eagles to go to.

7 And if we don't have some relationships,
8 some explicit cause/effect relationship, as Dr.
9 Baskerville suggests and forward looking analysis of
10 system performance, we may end up in a irretrievable
11 sink in terms of a demand for wildlife habitat.

12 MR. MARTEL: Can I ask question. Why
13 wouldn't we have a tree 15 years from now?

14 MR. HANNA: Trees fall down.

15 MR. MARTEL: Yes, sure, but under any
16 process the tree would fall down, including adaptive
17 management.

18 MR. HANNA: Oh, no question at all, Mr.
19 Martel. I think the point is, will there be trees of
20 sufficient size and location in the future that the
21 eagles can move to. Unless we look at it in a temporal
22 way we won't know that that in fact is the case.

23 By preserving that tree today, it is hit
24 by lightening tomorrow, do the eagles have another
25 place to go. That's the type of evidence that we will

1 be bringing forward.

2 MADAM CHAIR: But under any system you
3 wouldn't suggest harvesting that tree --

4 MR. HANNA: Oh, not at all. Not in any
5 sense, no, Madam Chair. I hope that wasn't the
6 inference that you gained from what I was saying.

7 MR. MARTEL: I guess what I am having
8 difficulty gathering or putting in my head is, how
9 would you in fact establish the area to guarantee or to
10 ensure that there is a tree 15 years down the road?

11 I guess I am having difficulty
12 comprehending how much you're going to have to set
13 aside or what you are going to set aside over the long
14 haul to ensure that there is a tree that's left for the
15 eagle to nest in.

16 MR. HANNA: Whatever comfort it might be
17 to you, Mr. Martel, I found that you aren't alone in
18 that problem, that I found most Ministry biologists
19 have the same problem. I don't say it's an easy
20 question to deal with, I think it's an important
21 question to deal with. There is not an easy answer to
22 it, it is one we have to examine.

23 MR. MARTEL: We can always build towers
24 for them.

25 MR. HANNA: Well, it's worked for osprey.

1 Q. Would you agree, Dr. Eedy, it is
2 essential not to just look at nest sites, but also to
3 look at potential nest sites that are expected to be
4 available over the rotation of the forest based upon
5 current and future management practices?

6 DR. EEDY: A. As I said before, I
7 certainly endorse the habitat suitability analysis
8 approach in that perspective but, at the same time, I
9 don't think it precludes having guidelines to protect
10 existing habitat.

11 Q. But this is a research program, this
12 is a research program to assist in management and it's
13 a research program to provide managers with direction
14 as to how to protect these key resource values.

15 Now, if management is a dynamic activity
16 that deals with time and space and the research deals
17 with a static mitigative approach, don't you see a
18 difficulty there?

19 A. I see necessities for both approaches
20 and I don't see that endorsing an affects monitoring
21 program necessarily has anything to do with not
22 endorsing another approach, such as habitat suitability
23 analysis, which we have strongly endorsed in our
24 document.

25 Q. All right. Dr. Eedy, as you

1 suggested, let's see if we can cut this short. Is it
2 fair to say then that the endorsement that we see in
3 terms of 52(a) and 57 of the Ministry of Natural
4 Resources' terms and conditions is with respect to the
5 principle, the underlying principle of the need for
6 affects monitoring, the actual nature of that affects
7 monitoring from a scientific point of view to something
8 that you feel should be looked at carefully but you
9 haven't done that at this time?

10 A. I think that would be correct, yes.

11 Q. Dr. Schiefer, we are back to that
12 again. Can you tell me what studies Beak has
13 undertaken in Ontario since the beginnings of 1988 to
14 examine adverse impacts of aquatic life as a result of
15 timber harvesting practices in the area of the
16 undertaking, as of the beginning of 1988?

17 DR. SCHIEFER: A. I really couldn't give
18 you an exhaustive list offhand, but I can certainly
19 determine that for you, if you like.

20 Q. You have under -- Beak has undertaken
21 studies in Ontario since the beginning of 1988 to
22 examine the adverse impacts of aquatic life as a result
23 of timber harvesting practices in the area of the
24 undertaking? If you have, I do want an exhaustive
25 list.

1 A. Since 1988? It's just that I'm not
2 familiar with all of the studies the company is doing
3 at any one time, so I don't have a knowledge
4 immediately of all of the work we're doing.

5 - There may well not be any, Mr. Hanna;
6 however, we are doing studies that, while they may not
7 involve research programs, certainly are examining the
8 relevant literature, certainly are looking at
9 appropriate methodologies for that doing.

10 Q. Well, I appreciate that. My question
11 was very narrow here. I'm not -- this isn't an attempt
12 to impeach the credibility of the evidence you brought
13 forward, I just want to be very clear here.

14 Since the beginning of 1988 have you
15 undertaken any affects, if you will, affects
16 monitoring, affects research on aquatic life as a
17 result of timber harvesting practices in the area of
18 the undertaking?

19 A. Could you perhaps give me just a
20 moment to confer with my colleagues? Between the
21 three of us I think we can probably provide you with
22 that answer.

23 Q. Sure.

24 A. Thank you for your patience, Mr.
25 Hanna.

1 MR. HANNA: The Board's patience is also
2 appreciated.

3 MADAM CHAIR: We have endless amounts of
4 patience, Mr. Hanna.

5 MR. HANNA: You shouldn't tell me that,
6 Madam Chair, but we do appreciate your patience.

7 MR. CASSIDY: Not to be abused.

8 DR. SCHIEFER: We, as you're well aware I
9 think from the material we provided in our witness
10 statement, carry out considerable numbers of studies
11 for the forest products industry across the area of the
12 undertaking. Many of them are more related to mill
13 effluents than they are timber harvesting practices.

14 However, when you do a study of a
15 watershed, as we do toxicity testing, sediment type
16 analysis, erosional, you know, byproduct type studies,
17 we are invariably looking at the effects of a number of
18 activities, not only mill effluents, but also other
19 effects in that watershed that could relate to timber
20 harvesting.

21 But I think a more precise answer is we
22 have not undertaken to my knowledge at this point a
23 specific study since 1988 in the area of the
24 undertaking of purely timber harvesting activities on
25 aquatic environments; however, we have undertaken a

1 considerable number of studies of other types of
2 watershed perturbation on aquatic resources such as
3 agricultural use, urban development, Hydro electric
4 types of development.

5 Q. Okay.

6 MR. CRAIG: A. Can I just add one thing,
7 Madam chair. And all of these techniques would be the
8 same techniques that one would apply to this sort of
9 assessment, as Mr. Hanna has mentioned.

10 Q. So methodologically you're saying you
11 have undertaken comparable studies and there is the
12 possibility of getting some anecdotal information from
13 the conventional type of work that Beak does in terms
14 of mill effluent studies?

15 DR. EEDY: A. I think there's one other,
16 if I could interject, too. One other point is, we are
17 involved in studies of timber harvesting activities in
18 the boreal forests, not within Ontario, but as I have
19 stated before, my belief is that species in areas such
20 as the boreal forest don't stop at geographical borders
21 and that our research that we are doing in Manitoba in
22 the same boreal forest type of habitat really has very
23 similar aspects to it.

24 Q. But, Dr. Eedy, some things do stop at
25 political borders, don't they, like Fish Habitat

1 Guidelines?

2 A. There are Fish Habitat Guidelines,
3 yes.

4 Q. So in that respect, political borders
5 are quite relevant?

6 A. To a certain extent, although we
7 certainly, in our research when we develop mitigative
8 measures - and on the fish issues, I think Dr. Schiefer
9 can certainly speak better than I do - we do not only
10 look at what's available within a political border, we
11 look at what is really the -- what we feel is the best
12 from all of the various jurisdiction that we're
13 involved in, and if we recommend mitigation to prevent
14 fish impacts in a harvesting area of Manitoba, we
15 certainly look at the Ontario guidelines as well as
16 other guidelines which exist to develop these
17 recommendations.

18 Q. Dr. Eedy, again, I am not impeaching
19 Beak in terms of its responsible application of
20 environmental guidelines. My question is, the Fish
21 Habitat Guidelines only apply to Ontario.

22 DR. SCHIEFER: A. That's true,
23 although --

24 Q. Other jurisdictions have other
25 guidelines?

1 A. Yes.

2 MR. CASSIDY: That wasn't the question
3 that was originally asked. He was originally asked
4 whether or not Beak undertakes studies to examine the
5 adverse impacts. He didn't --

6 MR. HANNA: In Ontario since 1988.

7 MR. CASSIDY: Just hear me out. I didn't
8 interrupt your question, now don't interrupt my
9 interrupt -- well, I will call it that because in fact
10 I think the question was -- this is not a fair line of
11 questioning.

12 The question that was asked was, if Beak
13 has undertaken studies to examine adverse impacts for
14 aquatic resources, not the question of whether or not
15 they have undertaken studies to assess the effects of
16 guidelines.

17 Mr. Hanna's point would be well taken if
18 he asked that question, but he didn't, so therefore the
19 question I think is - and this is the second question -
20 is unrelated and unfair to Dr. Eedy's question -- or to
21 Dr. Eedy's answer about these studies outside Manitoba.

22 MR. HANNA: Madam Chair, I think I could
23 effectively argue that --

24 MR. CASSIDY: Or Ontario.

25 MR. HANNA: Madam Chairman, I think I

1 could effectively argue that interjection. I will
2 just -- for the interest of time let's just leave it
3 where it is.

4 MR. CASSIDY: Thank you.

5 MR. HANNA: Q. I will go back to where I
6 was coming from and that is, the Fish Habitat
7 Guidelines apply to Ontario; correct, Dr. Schiefer?

8 DR. SCHIEFER: A. The Ontario Fish
9 Habitat Guidelines apply to --

10 Q. Right. And there may be other
11 guidelines in other jurisdictions?

12 A. There certainly are.

13 Q. And they identical to the Ontario
14 guidelines?

15 A. They are similar in many respects.

16 Q. But they aren't identical?

17 A. Not identical.

18 Q. And their application is different
19 because of the very fact that you've got different
20 people applying them, different approaches under which
21 they were applied? They're different.

22 A. They are different elements to them,
23 yes. The objective is the same, however.

24 Q. Absolutely. I'm simply speaking as
25 far as the nature of the guidelines and how they're

1 applied. Were not the Fish Habitat Guidelines formally
2 introduced in April 1988? That's when they came into
3 force?

4 A. I have no knowledge of the exact
5 date.

6 Q. Was not the Code of Practice
7 introduced on February 1st, 1989 and is not still in
8 the process of being placed into policy?

9 A. That's my understanding, but I'm not
10 on authority on the timing.

11 Q. Okay. On page 16 of your witness
12 statement, you indicate in the first full paragraph
13 toward the top of the page:

14 "Beak has not observed and is unaware of
15 any scientific literature which
16 demonstrates adverse impacts on aquatic
17 life as a result of timber harvesting
18 practices which follow the procedure and
19 provisions of the guidelines and the Code
20 of Practice."

21 Given that the guidelines and Code of
22 Practice -- the Code of practice isn't even in policy
23 yet and the guidelines have yet to -- have only been
24 introduced in 1988, you haven't undertaken studies in
25 the area of the undertaking, would you not agree that

1 it is highly unlikely that you would find such
2 literature or even that you would have observed such
3 effects in the field given their very recent
4 introduction, if effects were there?

5 A. I guess that would depend on a strict
6 interpretation of procedures and provisions of the
7 guidelines and Code of Practice.

8 Certainly there have been practices,
9 historical practices relating to the provision of
10 buffer zones around lakes and streams. The guidelines
11 and Code of Practice may alter the nature of those
12 buffers; however, the concept of having buffers and the
13 benefit those buffers provide, there has been
14 substantial scientific literature on that and I think
15 we are referring more to the principles than the
16 exact -- the exact application of those guidelines.

17 Q. But we've spoken at some length, now
18 it is two days, almost more than two days ago, it was
19 unfortunately two weeks ago, about the fact that the
20 guidelines and their application is very site specific,
21 it depends very much upon the intensity and nature on
22 which they're applied, overriding factors that like
23 that really influence their net effect.

24 Is that not a fair statement?

25 A. They certainly do provide a measure

1 of flexibility and site specific adaptability in their
2 application, that's true.

3 Q. So in order to come to some
4 conclusion as to whether or not there will be positive
5 or -- excuse me, or whether there will be adverse
6 impacts on a aquatic life or not, really you have to
7 test not just the principle but the application?

8 A. That's true, and it's my
9 understanding that the Ministry of Natural Resources
10 has a program conceived to do that.

11 Q. Dr. Schiefer, I believe you are
12 familiar with the concept of cumulative impacts. I am
13 going to speak now on cumulative impacts associated
14 with aquatic systems. I have spent some time this
15 morning talking with Dr. Eedy on cumulative impacts
16 with terrestrial systems, I would like to speak now
17 with aquatic systems. You are familiar with that
18 concept?

19 A. Yes.

20 Q. And I asked you to read Exhibit 812.
21 You've done that?

22 A. Yes, I have.

23 Q. Now, I didn't see any reference in
24 your witness statement specifically to cumulative
25 watershed impacts; is that correct?

1 A. Not specifically, no.

2 Q. Is it there indirectly in a way that
3 I should have picked up?

4 A. Generally when we talk about impacts,
5 we tend to be less specific in terms of cumulative --
6 identifying cumulative impacts.

7 Q. I'm sorry, you...?

8 A. We often include cumulative impacts
9 as a subset of impacts.

10 Q. Are you referring to a specific part
11 of your witness that I should be looking at? I just
12 want to make sure I understand your witness statement.

13 Where is that subset or where would that
14 subset fall in the statements you have here in Section
15 2?

16 A. What I am referring to, Mr. Hanna, is
17 that we include the concept of cumulative impacts
18 within the concept of impacts, whether they're site
19 specific, you know, one time, one effect type of impact
20 or longer term multi-effect cumulative impacts.

21 Q. So let's just take an example. I
22 find it much easier to deal with specific examples.
23 Let's look at page 16 and the conclusions that you came
24 to with respect to the provisions of the guidelines and
25 the Code of Practice.

1 You are saying here that these provisions
2 are key to minimizing or avoiding any adverse effects.
3 Could I say impacts there, impacts on aquatic resource?
4 Would that be the same thing in your term?

5 I am trying to get a specific example so
6 I can see how you've used the term cumulative impact in
7 your witness statement. Would that be an example?

8 A. I'm sorry, could you ask that
9 question again?

10 Q. Sure. I'm looking here at this
11 statement:

12 "In Beak's opinion, the following
13 provisions of the guidelines and Code of
14 Practice are key to avoiding or
15 minimizing any adverse..." and you've
16 used the word "...effects."

17 Could we use the word impacts there? I
18 want to see how cumulative impacts are captured in
19 these five points below.

20 A. I don't see a benefit in changing the
21 term effect to impacts.

22 Q. Is your subset of cumulative impacts
23 captured in those five actions that are listed there?

24 A. Well, I think -- the concept is that
25 these types of actions provide a benefit, a mitigation,

1 if you'd like, to not only one potential impact per
2 provision but, rather, they may provide a benefit to,
3 for instance, an impact on water temperature, as well
4 as a benefit to preventing soil erosion, as well as
5 providing a benefit to the continued provision of
6 instream habitat. It is not a situation where each
7 measure has only one corresponding environmental
8 benefit; in fact, they have multiple benefits.

9 Q. Okay. I don't want to go back and
10 review that again. What I'm trying to just get at is,
11 how you've incorporated cumulative watershed impacts as
12 a subset of impacts in your witness statement.

13 Can you show me where in your witness
14 statement I would see that illustrated?

15 A. Mr. Hanna, if you're looking for the
16 term, cumulative --

17 Q. No, you've told me the term is not
18 there. You are telling me that implicitly you have
19 rolled that into your term impact and I want to see
20 where -- an example of that in your witness statement.

21 MADAM CHAIR: He just gave us an example
22 with these five--

23 MR. HANNA: No, Madam Chair.

24 MADAM CHAIR: --actions and the fact that
25 it leads to multiple benefits. Are you asking for

1 adverse cumulative impacts?

2 MR. HANNA: He said these are actions
3 that will have -- and perhaps Dr. Schiefer will
4 interject if I am incorrect. These are actions that
5 will have benefits, both direct benefits and cumulative
6 impacts across the watershed.

7 Q. Is that a fair statement of what you
8 have said, Dr. Schiefer?

9 DR. SCHIEFER: A. Well, it's a different
10 way of phrasing it. I think -- I mean, we don't look
11 at these particular provisions as having a simple one
12 time, one effect benefit. In fact, they have multiple
13 benefits and they provide to -- contributing to a
14 cumulative -- the avoidance of a cumulative impact.

15 Q. They may?

16 A. They hopefully will, yes.

17 Q. Hope is, how does it go, burns
18 eternal, but sometimes one is more assured when one
19 examines things in more detail than just hoping.

20 Have you examined in detail these steps
21 from a cumulative impact assessment point of view on a
22 watershed basis?

23 A. We've examined the relationship
24 between individual activities such as these as they
25 relate to the benefit intended in a receiving water,

1 yes. We have not done a 20-year control study to see
2 whether cumulative impacts over an extended time period
3 in fact are derived.

4 I understand that's the reason why the
5 Ministry of Natural Resources is launching a program to
6 do that.

7 Q. Now, in the -- on page 17 of your
8 witness statement under the heading 2.5 Buffer Zone
9 Widths, second paragraph, you make reference to a study
10 by Barton et al 1985 and you state that:

11 "They estimated, for typical streams of
12 this region, that an unbroken buffer
13 extending 3 kilometres upstream need
14 only be 10 m wide to produce a
15 maximum weekly temperature of less than
16 22 degrees C..."

17 The key issues that these authors have
18 identified is that one needs to look at activities
19 across the watershed and on this basis developed a
20 prescription for a specific area.

21 Is that a fair statement? You can't just
22 look at the immediate area where the action is taking
23 place, you have to look across the whole -- at least,
24 in this case, three meters -- three kilometres
25 upstream?

1 A. I'm quite familiar with this
2 particular piece of research and in fact we are
3 actually applying some of these observations to test
4 the hypothesis built into some habitat suitability
5 index currently.

6 One of the primary concepts here is that
7 where you have removal of riparian vegetation, whether
8 that removal is related to agricultural activities or
9 urban development or timber management harvesting or a
10 forest fire, you will have elevations of water
11 temperatures within that area of riparian vegetation
12 removal and, in fact, the paper describes that some of
13 those increases can be three, four degrees Celsius,
14 which is significant from a fisheries point of view.

15 However, that temperature will recover
16 back to the natural expected level within three
17 kilometres of flow through a zone that has at least a
18 10-metre vegetative cover in a riparian area and that's
19 the primary focus of this research.

20 Q. Yes, I'm familiar with the research
21 also. I mean, it's also a stream that's fed, to a
22 large extent, by ground water seepage; is it not?

23 A. The majority are, yes.

24 Q. But the question I asked you was, in
25 order to deal with these types of issue you have to

1 look at the watershed? It's not sufficient just to
2 look at the one site, one has to look at the watershed
3 and all the things that are taking place in the
4 watershed. Would you agree with that principle?

5 A. Not necessarily for water
6 temperature.

7 Q. All right. How about for water
8 nutrients?

9 A. Nutrients, that argument would be
10 more relevant for nutrients because with nutrients you
11 do have a cumulative downstream effect. With
12 temperature, you can have an elevation of temperature
13 in one section of stream. As this paper points out, in
14 fact depending on what the vegetation cover in the
15 riparian zone looks like --

16 Q. And the ground flow?

17 A. And the ground flow, that temperature
18 can decrease.

19 Q. Right.

20 A. So in fact the temperature is not a
21 cumulative effect. Temperature may increase in one
22 area, decrease in another, be constant in a third.

23 Q. Or it can in fact cumulate down a
24 stream, depending upon the actual hydrology of the
25 stream system?

1 A. It's unlikely for temperature.

2 Q. Can you confirm for me that the Fish
3 Habitat Guidelines as they currently stand do not deal
4 with watershed level impacts?

5 A. No, I can't make that interpretation.

6 Q. You are familiar with the formal
7 procedures used by the U.S. Forest Service in terms of
8 looking at water quality and quantity impacts on a
9 watershed?

10 A. I am generally, yes.

11 Q. Are you suggesting that the Fish
12 Habitat Guidelines deal equally in terms of water
13 quality and quantity on a watershed basis?

14 A. They don't explicitly; however, many
15 of the provisions would likely provide a watershed
16 level benefit. Whether that was intended when they
17 were formulated, I really can't comment on.

18 Q. Do the Fish Habitat Guidelines look
19 at matters such as patch cuts and other things that
20 don't occur directly adjacent to streams?

21 A. Fish Habitat Guidelines relate to
22 specific zones of activity.

23 Q. Areas that are immediately adjacent
24 to a waterbody?

25 A. By and large, yes.

1 Q. Is it not true that only until one
2 looks at the entire watershed in a predictive way that
3 a conclusion can be reached as the appropriate level of
4 disturbance and required mitigation measures?

5 A. I'm afraid I think that's too broad a
6 generalization. It depends on many circumstances
7 within the watershed, the homogeneity of the watershed,
8 the topography, the soil types. There are many factors
9 that would go into that type of determination.

10 Q. How would that -- explain to me why
11 that would -- I'm not sure which way it would go,
12 better or worse.

13 In a more homogeneous watershed you would
14 not have to be -- look at predictively in terms of the
15 nature of the impacts, or heterogeneous watershed you
16 wouldn't have to. How does it go?

17 A. I don't believe you need to look in
18 detail at every activity that occurs in any part of a
19 watershed to be able to access or predict what happens
20 to a particular water quality parameter at a downstream
21 location.

22 Q. How much of the watershed do you have
23 to look at?

24 A. Again, I think any aquatic biologist
25 or hydrologist would suggest that that is a very site

1 specific consideration.

2 MADAM CHAIR: Dr. Schiefer, you discussed
3 this with respect to putting buffers around first and
4 second order streams and your reasoning at that time, a
5 long time ago when we talked about this, was that you
6 didn't think it was necessary in every case to
7 automatically institute buffers on waterbodies further
8 out in the watershed from the large waterbody we were
9 looking at, those various streams.

10 At that point you thought it was
11 necessary for site visits to be made rather than apply
12 the guidelines by the book or on the basis of mapping,
13 that you felt it was a better system where it was
14 possible for the decision to be made with an
15 investigation of what the situation was and whether or
16 not it required a buffer.

17 DR. SCHIEFER: That's correct, Madam
18 Chair.

19 MADAM CHAIR: And you've just told us in
20 this situation that in fact you can derive more general
21 information about a large watershed area from sources
22 other than making a site inspection?

23 DR. SCHIEFER: No, I didn't mean to imply
24 that. I think this particular question and response
25 was, in terms of determining what cumulative downstream

1 effects are on a particular water quality parameter,
2 say, nutrient level, for instance, one need not look
3 at, as Mr. Hanna's example, patch cuts in areas -- you
4 know, in some headwater area. I don't think it really
5 relates to whether buffers are required on first or
6 second order streams.

7 MADAM CHAIR: No, but in the sense that
8 the two tie together, if you are putting buffers within
9 a larger watershed area, then presumably you are
10 migrating against possible impacts, cumulative, one
11 time, whatever,

12 DR. SCHIEFER: That would certainly be
13 intent, yes.

14 MR. HANNA: Q. And is not implicitly
15 what you are saying, Dr. Schiefer, that you have to
16 look at it in a predictive way?

17 You have to look at how the watershed is
18 functioning on that basis to make those determinations?
19 Isn't that -- whether it's implicit or explicit, that's
20 in fact what you're doing?

21 DR. SCHIEFER: A. Well, one is normally
22 looking at the mechanisms for impact and then trying to
23 avoid or mitigate those types of effects. In this case
24 it's provision of Fish Habitat Guidelines or Codes of
25 Practice for activities within that possible impact

1 zone.

2 Q. You are way, way miles ahead of me.
3 You said you've got mechanisms and then you start
4 mitigating. Now, how do you go from mechanisms and
5 mitigating without having used the mechanisms,
6 predicted an impact and then decide I am going to
7 mitigate it? Don't those intervening steps have to be
8 there, either implicitly or explicitly?

9 How can you mitigate something you haven't
10 predicted?

11 A. Well, in this case the prediction is
12 based on substantial literature as to the effects of
13 certain activities on various water quality or quantity
14 parameters.

15 Q. But you yourself has said every
16 watershed is different, we've got to make these site
17 specific determinations, it isn't appropriate in all
18 cases to have every first order stream protected with a
19 buffer zones. Isn't that what you've told us?

20 A. That's correct.

21 Q. And the reason you've told us that is
22 because they are all different, the mechanisms are
23 maybe the same but the actual impacts may vary based
24 upon the specific nature of the sites; correct?

25 A. Generally that's correct, yes.

1 Q. You would have to look at it at a
2 watershed level. That's how aquatic systems work;
3 isn't it?

4 A. I'm not suggesting we don't look at
5 the watershed level. I guess it depends on what you
6 mean by looking at it at a watershed level.

7 Q. I mean you have to look at it at a
8 watershed level, that's what I mean and that's what I
9 said, that you have to look at it in a predictive way
10 at a watershed level. Now, do you agree or disagree?

11 A. I agree with the concept. I'm not
12 sure what your application of that implies.

13 Q. My original question was simply a
14 concept, I will get into the details in just a minute,
15 but that was five minutes to get to the concept answer.
16 That's what I asked you as a concept and I think we now
17 agree.

18 Is not the thrust of the work currently
19 ongoing in the U.S. with respect to cumulative impacts
20 at a watershed level? Particularly what I am referring
21 to is Exhibit 812 that I've asked you to look at.

22 A. Well, not to split, but at a
23 watershed or sub-watershed level, yes.

24 Q. Fine. Now, can we look specifically
25 at 812 for a moment and specifically the first sentence

1 -there, it says:

2 "Acceptance and use of cumulative
3 watershed effects analysis has been slow,
4 even agonizing at times."

5 Is this your experience in Ontario also?

6 A. Well, I wouldn't use those terms, but
7 there has been a growing acceptance of the concept of
8 cumulative impact, yes.

9 Q. Later on in that next paragraph they
10 say that certain court decisions in the States have
11 upheld complaints that cumulative watershed effects
12 were inadequately addressed in timber harvest planning.

13 Why would that similar type of complaint
14 not be applicable in Ontario? Do they not all have,
15 for all intents and purposes, the same types of
16 guidelines in the U.S. as we're using? In fact, this
17 author talks about it later in the paper, doesn't he,
18 in terms of best management practices?

19 A. Yes, this author is basing these
20 opinions on his experience in California. I've also
21 had experience at working with the kinds of studies he
22 is talking about in California and the kinds of
23 concerns they have are generally more acute in
24 California.

25 The conditions, watershed

1 characteristics, morphology, hydrology are quite
2 different than they are in the boreal forest zone of
3 Ontario. Soils are far more erodible, the terrain is
4 generally considerably steeper. So certainly there are
5 similar types of concerns in Ontario, but not to the
6 degree of the kinds of problems that they've had in
7 many areas of California.

8 Q. I am tempted with an area as variable
9 as the undertaking to start picking examples that might
10 challenge that, but let's accept that for the time
11 being. Are cumulative watershed effects currently
12 addressed in timber management -- timber harvest
13 planning in Ontario of the nature that's described in
14 this exhibit?

15 A. No, I have a problem in commenting on
16 what takes place in timber management planning in
17 Ontario. I'm not --

18 Q. You've seen the result. Do you have
19 any from the result point of view?

20 A. Well, from the result point of view,
21 I'm not aware of having seen or studied the watershed
22 in Ontario that demonstrates a long-term cumulative
23 negative impact of timber harvesting.

24 Q. You are familiar with the paper by
25 Neville Ward, which is Exhibit 808, that has been

1 entered as evidence in this hearing?

2 A. Yes, I am.

3 Q. Without going through the long litany
4 of impacts that Mr. Ward describes in this paper, is it
5 not fair to say that at least he is of the view that
6 there are -- I will use his words:

7 "Even in areas such as northwestern
8 Ontario where most lakes lie on the
9 granitic Precambrian shields, many areas
10 have erodible clay and sand soils..."

11 He is suggesting that similar types of problems with
12 those that have been observed in the U.S. occur at
13 least in northwestern Ontario. Do you disagree with
14 him?

15 A. I agree with him that those types of
16 soils exist in that area.

17 Q. And then he goes on on page 4 of this
18 and says -- goes through his litany of all the
19 different things that can happen BOD, increased
20 nutrients, temperature effects, water yields,
21 deposition of organic material, there is a whole
22 variety of these, and he ultimately concludes that:

23 "...watershed management will be required
24 to fully reconcile the objectives of
25 fish and wildlife and forestry programs."

1 Do you disagree with that view?

2 A. Can you refer me to that excerpt,
3 please.

4 Q. Yes, it's on page 4, the right-hand
5 column towards the bottom of the page, second paragraph
6 before the bottom of the page.

7 MR. FREIDIN: Whereabouts?

8 MR. HANNA: First sentence.

9 MR. FREIDIN: Does it start with:
10 "Governments..."

11 MR. HANNA: I didn't read the whole
12 sentence, I said:

13 "...watershed management will be required
14 to fully reconcile the objectives of
15 fish, wildlife and forestry programs."

16 Q. Do you disagree or agree with that
17 view?

18 DR. SCHIEFER: A. I agree with that
19 view.

20 Q. Are you of the view that governments,
21 in particular the Ontario government, in particularly
22 the Ministry of Natural Resources, has already
23 progressed to the point that he is referring to here?

24 A. I have no knowledge of that.

25 Q. Looking again at Exhibit 812 on page

1 268, the left-hand column, the first full paragraph,
2 the author says:

3 "Such a cumulative effect could occur..."
4 and I believe he's talking here about quantity and
5 quality changes in terms of run off,

6 "Such a cumulative effect could occur
7 even if best management practices or the
8 States forest practice rules were
9 implemented. Best management practices
10 such as stream site protection, equipment
11 exclusion, zones or proper road
12 construction help reduce, but do not
13 always stop cumulative effects.
14 Cumulative watershed effects analysis is
15 used to reduce the risks of such
16 effects."

17 Would you not agree that the use of the
18 guidelines and Code of Practice are similar to that is
19 referred to here as best management practices?

20 A. They would appear to be, but they are
21 not the same.

22 Q. They are not the same in terms of
23 their specific provisions, but they're similar in terms
24 of the nature of their application and the types of
25 effects they try to deal with?

1 A. I think their intent is similar.

2 Q. So, therefore, you would agree that
3 these measures, these best management practices,
4 whether they are in Ontario or elsewhere, do not always
5 stop cumulative effects?

6 Providing a buffer zone of ten meters a
7 long a stream will not assure that we don't have
8 nutrient elevations in that stream, for example?

9 A. Well, this is a conclusion that this
10 particular author has made based on his experience in
11 California. I don't think it can necessarily be
12 applied to a situation in central Ontario.

13 Q. My question was, do you agree that
14 best management practice measures, such as the
15 guidelines and Code of Practice, do not always stop
16 cumulative watershed effects?

17 A. I personally have no evidence to
18 support that.

19 Q. Do you have any evidence to refute
20 it?

21 A. No, I do not.

22 Q. Are you familiar with any application
23 in Ontario of cumulative watershed effects analysis for
24 timber management planning?

25 A. No, not explicitly.

1 Q. Well, cumulative watershed effects
2 analysis is a pretty specific thing, is it not, Dr.
3 Schiefer? Is it not fairly well laid out in the U.S.?

4 A. Mr. Hanna, the thing I can't comment
5 on is whether the drafting of the guidelines and the
6 Codes of Practice, whether they address the concept of
7 avoiding, mitigating cumulative impacts. They are not
8 specific in that.

9 Q. But the guidelines are not cumulative
10 effect analysis, that's a very specific type of
11 approach; is it not?

12 A. I don't see it that --

13 MADAM CHAIR: You just said, Mr. Hanna --
14 I thought the question was that they were the same
15 thing, that you were asking in Ontario whether Dr.
16 Schiefer knew of any cumulative effects analysis.

17 MR. HANNA: Yes, I asked him that
18 question.

19 MADAM CHAIR: Where does this other part
20 come in?

21 MR. HANNA: Dr. Schiefer said he wasn't
22 sure whether or not the guidelines implicitly or in the
23 development of them had somehow or another taken those
24 things into account, and my question to the witness
25 was: But cumulative effects analysis is a very

1 specific procedure in technique, quite exclusive from
2 applying guidelines, and that was the question I asked
3 him, if he doesn't see that as being two very
4 distinctly different approaches to addressing water
5 quality impacts.

6 MADAM CHAIR: All I have gotten so far
7 out of Dr. Schiefer's answer is that he doesn't know of
8 any explicit analyses of cumulative impacts on water
9 sheds vis-a-vis timber management in Ontario and after
10 that I am lost, so maybe you could go back and start.

11 MR. HANNA: Okay, Madam Chair.

12 Q. Cumulative effects analysis has been
13 developed into a very specific procedure in the United
14 States; is that correct, Dr. Schiefer?

15 MADAM CHAIR: Are you just talking about
16 watersheds, Mr. Hanna?

17 MR. HANNA: Oh, I'm sorry, Madam Chair.

18 MADAM CHAIR: Or are you talking about
19 everything --

20 MR. HANNA: I will wind back here. Once
21 I started talking with Dr. Schiefer I am talking solely
22 of aquatic effects and solely of watershed effects.

23 Too bad we didn't have two different
24 terms for cumulative effects, one being for terrestrial
25 systems and one being for aquatic systems, but I am

1 dealing solely here with aquatic systems.

2 DR. SCHIEFER: There have been attempts
3 to introduce that concept in some jurisdictions, but
4 there is not a broad approach to that in the U.S.

5 MR. HANNA: Q. Are you familiar with the
6 RENS procedure, Dr. Schiefer?

7 DR. SCHIEFER: A. Only in a very general
8 way.

9 Q. Is it used broadly throughout the
10 United States by the U.S. Forest Service?

11 A. I'm not aware of how broadly they use
12 it.

13 Q. Back to the question, though, there
14 is a very distinct difference, from a procedural point
15 of view, between applying guidelines and applying
16 cumulative effects analysis?

17 Cumulative effects analysis, they aren't
18 necessarily mutually exclusive; I may take my
19 guidelines, apply them on a watershed and undertake a
20 cumulative effects analysis to see how well they deal
21 with my concerns in terms of the aquatic system. Is
22 that a fair statement?

23 A. Yes, although that does not preclude
24 the guidelines anticipating or attempting to address
25 the cumulative effects issue.

1 Q. I accept that. I accept that point.
2 But the only way that we will know is if we undertook
3 cumulative effects analysis?

4 A. A monitoring type of analysis, yes.

5 Q. And a predictive type of analysis?

6 A. It's an option.

7 Q. But we wouldn't know unless we
8 undertook that type of analysis; would we?

9 MADAM CHAIR: You wouldn't know what, Mr.
10 Hanna?

11 MR. HANNA: Q. We wouldn't be able to
12 know whether the fact the guidelines adequately deal
13 with the watershed level effects that you are
14 suggesting may be already built into them because it is
15 implicit?

16 MADAM CHAIR: Well, you would know if you
17 were monitoring a waterbody and you were following a
18 fish or some other measure.

19 Would you call that a cumulative impact
20 analyses? If you didn't see any detrimental effects,
21 you would say that was insignificant because you didn't
22 apply cumulative impact analysis?

23 MR. HANNA: Madam Chair, I would say
24 that's not analysis, I would say that's monitoring.
25 Monitoring is after the fact. We would know whether or

1 not impacts have taken place if they had --

2 MADAM CHAIR: You want to do this
3 analysis before --

4 MR. HANNA: As part of the planning
5 process.

6 MADAM CHAIR: Before you do any
7 mitigation at all?

8 MR. HANNA: No, you would want to --
9 well, mitigation, I'm not sure whether the mitigation
10 is the action or the plan. In terms of the plan, what
11 you would --

12 MADAM CHAIR: Let's say you want results,
13 let's say you don't want to damage the environment.

14 MR. HANNA: Fine.

15 MADAM CHAIR: Now, where does cumulative
16 impact analyses fit in?

17 MR. HANNA: It's part of your planning
18 process. I look and I say: Here is a watershed, I am
19 planning on putting in 10-metre buffers here and
20 30-buffers here and no buffers here because someone
21 like Dr. Schiefer has gone out and said I think we can
22 do it here. I take my cumulative effects procedure and
23 say: Okay, What do I expect is going to happen there
24 in terms of water quality.

25 On the basis of that, I then evaluate

1 whether or not the environment is at risk, and if I
2 feel the environment is at too much risk, then I adopt
3 some other mitigation strategy to deal with it, but
4 it's used in a predictive way in that sense.

5 The monitoring is used, again back to the
6 adaptive management type concept, to improve my
7 predictive capability the next time that I am faced
8 with that type of a dilemma.

9 MADAM CHAIR: So you are supporting the
10 argument that you don't need automatic buffers, that
11 you should do a cumulative impact analysis and decide
12 whether or not any measures should be taken in a
13 site-specific area?

14 MR. HANNA: What we are suggesting or
15 what we will be suggesting in our evidence, Madam
16 Chair, is that one way to deal with the types of
17 concerns that Dr. Schiefer has raised and the Industry
18 has raised in terms of flexibility is let's look at the
19 system, let's look how the system performs and use that
20 as a basis then to determine whether we should have
21 10-meter buffers, 30-meter buffers or no buffers in
22 appropriate areas, and to look at what's happening in
23 the watershed as a whole concurrently with that.

24 Q. So, Dr. Schiefer, back to where I
25 was. We have two approaches that aren't mutually

1 exclusive. You see that?

2 DR. SCHIEFER: A. Yes, I see.

3 Q. And you see that the cumulative
4 effect analysis could be used as a way to deal with the
5 types of problems that you've addressed in terms of -
6 is your word overconservatism or unnecessary - buffer
7 strips in some situations?

8 A. Under ideal circumstances it may
9 provide you with more site specific information on
10 which to make some decisions.

11 However, the concept of applying
12 guidelines to protect a specific resource value, and
13 commonly it would be -- a watershed would have a trout
14 population that you would want to protect, you would
15 apply guidelines based on the aquatic habitat fish
16 protection guidelines, you would monitor to determine
17 their effectiveness and if they were effective over a
18 given period of time in mitigating any of these
19 potential concerns, I would submit that the -- you have
20 not only addressed the issue of the short-term impacts
21 on that resource, but also the long-term cumulative
22 impacts on that resource.

23 Q. And what if we haven't, Dr. Schiefer?

24 A. I'm sorry?

25 Q. What if we haven't?

1 A. What if we haven't what?

2 Q. What if the trout all go because we
3 had adequate buffer strips but we had too large a
4 clear-cut or we sprayed with herbicides and we
5 shouldn't have or we built roads where we shouldn't
6 have built them, other parts of the watershed?

7 The only way we are going to know is by
8 putting the environment at risk and finding out after
9 the fact? You are the one that says we have adequate
10 knowledge now to make good management decisions, why
11 shouldn't we use that knowledge in a predictive way?

12 A. I am not suggesting we shouldn't.

13 Q. Isn't cumulative effects analysis a
14 way to use that best management in a management sense?

15 A. I'm not suggesting we shouldn't
16 use -- we shouldn't look at cumulative effects.

17 Q. It is how we should look at it? We
18 just put our faith in the guidelines and wait and see
19 what happens?

20 A. I haven't suggest that either.

21 Q. What are you suggesting?

22 A. Well, the evidence I gave is that to
23 my knowledge, and we have looked at considerable
24 numbers of watersheds in Ontario, that we have yet to
25 see a measurable negative effect of timber harvesting

1 activities on fish habitats or fish in Ontario.

2 So I'm not sure there is a persuasive
3 argument that current practices lead to long-term
4 cumulative negative impacts. I'm not suggesting we
5 don't need to consider these and ensure they don't
6 happen, I am just -- I am making the statement that
7 unlike -- it may well be the situation in California
8 where their timber harvesting practices are certainly
9 different, where their aquatic watersheds and fishery
10 resources are certainly different and the threats of
11 damage are certainly different. Because of the
12 variations in terrain, soil type, climate, it may be a
13 far greater concern there.

14 Q. So you are suggesting put your faith
15 in the guidelines and wait and see what happens?
16 That's what you're saying; is it not?

17 A. No, I guess what I'm saying is that
18 unless you have good evidence that you have a
19 substantial problem, you really needn't divert a lot of
20 time and energy to preventing something that may well
21 not occur.

22 Q. Isn't that the whole concept behind
23 cumulative effects analysis whether it's for
24 terrestrial or aquatic systems, it occurs over large
25 areas, time and space and it's extremely difficult to

1 defect the effects? Isn't that the whole essence of
2 the concern?

3 A. Yes, that is the concern, Mr. Hanna.
4 However, if we carry it to the extreme, we are dealing
5 with an environment that's changing because of global
6 warming, acidification of precipitation, large scale
7 effects that are changing our environment over time.
8 So I guess you have to draw some boundaries on what
9 effects over what period of time.

10 Q. Dr. Schiefer, you are the one that is
11 suggesting we should change buffer strips on first
12 order streams.

13 How do you put that in the context of
14 global warming, and I forget the other examples? That
15 takes you nowhere, that argument, doesn't it, we might
16 as well forget the whole process?

17 A. No, it's not my argument, Mr. Hanna.
18 I'm simply saying that you need to draw boundaries
19 around the concept of long-term cumulative effects; how
20 long term and what effects.

21 Q. Fine. And how are you proposing to
22 define those boundaries other than to undertake some
23 sort of cumulative effects analysis, at whatever level
24 of detail you feel is appropriate, and look at what the
25 future might hold? Is there another way?

1 A. Mr. Hanna, I'm not disagreeing that
2 there is a need to consider cumulative effects.

3 Q. Okay. It seems like we have gone
4 around this circle before. How are you proposing to
5 deal with looking at cumulative effects analysis at a
6 watershed level?

7 A. The program proposed by the Ministry
8 of Natural Resources would in fact monitor--

9 Q. Wait and see?

10 A. --on a longer term basis. It's
11 certainly a viable approach.

12 Q. Wait and see?

13 MR. FREIDIN: He already said it's a
14 viable approach.

15 DR. SCHIEFER: Measure, monitor, revise
16 the guidelines to make them more appropriate.

17 MR. HANNA: Q. And you see no advantage
18 in taking the knowledge that we have at the present
19 time, that best available knowledge that feel is
20 adequate for management decisions, and applying that at
21 a watershed level in terms of cumulative effects now?

22 DR. SCHIEFER: A. That may well be a
23 useful tool in the planning process, but I can't really
24 assess how useful that is from a planning perspective.

25 Q. But you can assess it in terms of

1 minimizing risk to the aquatic environment. Would you
2 not agree that that could make a significant reduction
3 in the risk to the aquatic environment, to provide some
4 assurance that those types of cumulative effects are
5 not likely to occur based upon our best available
6 knowledge?

7 A. -Well, I think -- you would have to
8 give me something more specific than just a very
9 general concept of a cumulative effects approach.

10 Q. Let's turn to page 270 of Exhibit
11 812, the right-hand -- the left-hand column, the first
12 full paragraph. This set out the procedure in general
13 terms used by the Forest Services region 5 methodology,
14 and there are four steps to the methodology.

15 The first is the forest hydrologist must
16 calculate the natural sensitivity index of a given
17 watershed; the second, the hydrologist creates a land
18 disturbance history; the third is, he undertakes a
19 field investigation; and the fourth is, he prepares an
20 evaluation in terms of defining whether or not the
21 watershed is near or at a threshold of concern, on the
22 basis on that further action is determined.

23 It's a pretty specific procedure. Do you
24 see some advantage in that, in using the best available
25 knowledge that you have said we have and deal with

1 these types of effects?

2 A. Well, Mr. Hanna, as I stated, I'm not
3 discounting this as perhaps a useful planning tool.

4 Q. Dr. Schiefer, Panel 10 of the
5 witness -- of the Industry is coming forward and they
6 are all, I think, quite experienced people in timber
7 management. They aren't - and I am sure Mr. Cassidy
8 will jump to his feet if I say something incorrect -
9 they are not people who are familiar with undertaking
10 aquatic impact assessments.

11 This is an aquatic impact assessment
12 issue. Is this a procedure to minimize the risk of
13 cumulative watershed effects that we currently do not
14 have in Ontario in the timber management planning
15 process, as far as you know?

16 A. I'm not aware that this is currently
17 done in Ontario.

18 Q. Do you see that as a viable approach
19 to minimizing the risk to the aquatic environment?

20 A. I would agree that it may have some
21 value in developing approaches to the application of a
22 protective guideline; however, there are many others as
23 well. I mean, this is a particular formula that is
24 deemed to be appropriate for the types of problems they
25 have in California.

1 I'm not suggesting that watershed type
2 assessment may not be a useful tool in Ontario.
3 Certainly we are currently involved in applying
4 methodologies like habitat suitability index models for
5 aquatic species. That provides promise and merit as
6 well.

7 Q. Can we turn to page 24 of the Ontario
8 Federation of Anglers & Hunters' terms and conditions,
9 particularly term and condition 137 and 138.

10 A. I'm sorry, what page was that?

11 Q. Page 24.

12 A. Yes.

13 Q. Can you read those two terms and
14 conditions and I would like to then ask you a question.

15 A. Which term numbers?

16 Q. 137 and 138.

17 MADAM CHAIR: Mr. Hanna, how much longer
18 will you be?

19 MR. HANNA: Madam Chair, I think I am
20 going to have to truncate my questions. I did some
21 others, but I'm not sure it's really fair to other
22 parties to continue at this point. I think what I will
23 do is terminate probably with -- if I could perhaps
24 have four or five more minutes and I will be finished
25 my questions.

1 MADAM CHAIR: All right, Mr. Hanna.

2 MR. HANNA: Q. Do you see any need --
3 first of all, do you agree that terms and conditions of
4 this nature would be a reasonable way to deal with
5 cumulative watershed effects?

6 DR. SCHIEFER: A. Well, they certainly
7 appear to address the concept of cumulative watershed
8 effects.

9 Q. As a fishery scientist and as a
10 consultant in this field, do you feel that this is a
11 reasonable way to deal with that concern?

12 A. Well, term and condition 137 states
13 that:

14 "The Fish Habitat Guidelines shall be
15 modified to provide specific direction to
16 prevent unacceptable cumulative water
17 quality impacts."

18 I'm not sure that it has been
19 demonstrated that there is a need for that. I mean, if
20 there is a need for that, then I would assume through
21 the monitoring program results that the guidelines
22 would be modified to be more responsive to that
23 concern.

24 Q. So you are saying we don't have
25 enough knowledge now to make that decision, despite

1 what you've told Mr. Lindgren about your feeling
2 confident that we have enough knowledge now to make
3 good management decisions?

4 A. No. I'm not aware that the Fish
5 Habitat Guidelines, as they're presently construed and
6 are intended to be applied, will not provide for
7 protection of cumulative impacts. This condition
8 assumes that they will be ineffective.

9 Q. All right. Let's stop there. Let's
10 not deal with the issue of whether or not cumulative
11 effects are important, let's deal simply with the
12 assumption, the hypothetical at this point, at least
13 from your point of view, that in some circumstances
14 they may be a problem.

15 Now, looking at this in terms of, again,
16 a fisheries scientist and manager, is this a
17 reasonable way to deal with those types of concerns?

18 A. Yes.

19 Q. 137 and 138.

20 A. If there is a problem, then this is a
21 reasonable way to address that problem.

22 Q. You make reference in your witness
23 statement to the Carnation Creek study; correct?

24 A. Correct.

25 Q. Did they find in the Carnation Creek

1 study that timber management impacts throughout the
2 watershed, not just in riparian areas, affected water
3 quality and quantity?

4 A. Are you referring to a particular...

5 Q. Well, I was trying, in the interest
6 of time, to avoid that. It is page 18, I believe, at
7 the top of page 18.

8 A. The second paragraph? The first full
9 paragraph?

10 Q. Dr. Schiefer, you're the expert,
11 you're the one that knows about the Carnation Creek
12 study, I asked you a simple question.

13 Did they not find in Carnation Creek that
14 timber management impacts throughout the watershed, not
15 just riparian areas, affected water quality and
16 quantity?

17 A. There were quite a number of effects
18 that they measured in Carnation Creek. From a
19 fisheries' perspective, some were positive and some
20 were negative.

21 Q. Dr. Schiefer, the Board's hungry, I'm
22 hungry, can you just answer the question.

23 Did they find in Carnation Creek that
24 timber management impacts throughout the watershed, not
25 just in riparian areas, affected water quality and

1 quantity? That's a yes or no answer, as far as I see
2 it.

3 MR. CASSIDY: Well, that's as far as you
4 see it, but the witness has the right to answer the
5 question in the appropriate fashion to assist the
6 Board.

7 I don't know how many times we have to
8 tell counsel or agents that. This is not an American
9 court, you cannot require the witness to answer the
10 question with a yes or no.

11 DR. SCHIEFER: Mr. Hanna, I am not trying
12 to be evasive. I mean, you are familiar with this
13 paper as am I. There are a number of effects, as I say
14 some positive, some negative. There were effects, yes.

15 MR. HANNA: Q. From actions not just in
16 riparian areas, but action through the watershed?

17 DR. SCHIEFER: A. Depending on the
18 particular effect, yes.

19 Q. I will at this time ask you the last
20 question in the hope that I might get a yes or no
21 answer, even though I realize I can't force it on you.

22 As a fisheries biologist, would you agree
23 that a predictive site-specific analysis would provide
24 greater assurance of achieving specific water quality
25 and quantity objectives than simply relying on fixed

1 province-wide buffer strip standards?

2 A. I can't give you a straight yes or
3 no, I'm afraid. I see merit in both approaches. We
4 currently use and apply the modelling approach. You
5 know, we --

6 Q. 'We' being Beak?

7 A. 'We' meaning Beak. It's very
8 effective for addressing certain issues. I see merit
9 in both.

10 Q. My question is: Would it provide
11 greater assurance, not suggesting again mutually
12 exclusive, simply the possibility of using them
13 together in tandem, would that provide you greater
14 assurance as a fisheries biologist of achieving
15 specific water quality and quantity levels in a
16 watershed? Is that not the reason you use them in
17 Beak?

18 A. No, we don't use them to achieve
19 greater assurance, we use them because they provide
20 different particular benefits in applications.

21 One may well be more of a protective type
22 management type benefit, the other may lend itself more
23 to a predictive type of analysis.

24 Q. But if I have both coming out saying
25 the same thing and we've got a high level of

1 uncertainty, wouldn't you feel more confident when they
2 both came out and said: As best as we know it looks
3 all right, rather than just relying on one tool,
4 particularly when you know there is the possibility, in
5 some circumstances at least, that there may be
6 significant effects?

7 A. There are different tools for
8 different applications.

9 Q. They can't be used for the same
10 application?

11 A. They provide different types of
12 outputs.

13 Q. They can be used for the same
14 application. The outputs may be used -- the same
15 outputs may be used to evaluate the same action?

16 A. I'm sorry, Mr. Hanna, I just don't
17 share that opinion.

18 MR. HANNA: Thank you, Madam Chair.

19 Thank you, Panel.

20 MADAM CHAIR: Thank you, Mr. Hanna.

21 The Board will break for an hour and a
22 half for lunch.

23 Ms. Kleer, one question, this isn't your
24 responsibility by any means, but with respect to the
25 discussion this evening about scheduling the cases

1 following Forests for Tomorrow, have you heard from
2 either Mr. Colborne or the Ontario Metis and
3 Aboriginal...

4 MS. KLEER: No, I have not.

5 MADAM CHAIR: We don't know if they are
6 going to be here this evening. They have not contacted
7 the Board.

8 MS. KLEER: Well, my understanding is, I
9 spoke to Ms. Swenarchuk today about another matter and
10 she told me that Don Colborne was not going to be here
11 today.

12 MADAM CHAIR: Do you know if she is
13 speaking on his behalf or not?

14 MS. KLEER: I don't believe so.

15 MADAM CHAIR: All right, thank you.

16 MR. CASSIDY: 1:45, Madam Chair?

17 MADAM CHAIR: Yes, Mr. Cassidy.

18 ---Luncheon recess taken at 12:15 p.m.

19 ---On resuming at 1:45 a.m.

20 MADAM CHAIR: Please be seated.

21 Ms. Kleer?

22 MS. KLEER: Good afternoon. I will just
23 refer you to the two exhibits that I will be referring
24 to that have already been introduced, Exhibit 665 and
25 Exhibit 1233.

1 MADAM CHAIR: What is 665?

2 MS. KLEER: 665 is the article by Frank
3 et al, Residues of 2,4-D, Dichlorprop and Picloram in
4 Wild Berries, et cetera.

5 MADAM CHAIR: Was that 1253 or 33?

6 MS. KLEER: 1233. It is the Weeks risk
7 assessment. We are only going to be referring to one
8 page of it. You may not need it in front of you, but I
9 thought you should know.

10 MADAM CHAIR: Do you have an extra copy
11 of Exhibit 665??

12 MR. CASSIDY: Madam Chair, we have one
13 copy.

14 MADAM CHAIR: Thank you, Mr. Cassidy.

15 MS. KLEER: (handed)

16 MADAM CHAIR: Thank you.

17 CROSS-EXAMINATION BY MS. KLEER:

18 MS. KLEER: Q. All right. If we could
19 turn to page 22 of the witness statement.

20 MR. CASSIDY: Sorry, which page?

21 MS. KLEER: Page 22.

22 MADAM CHAIR: Ms. Kleer.

23 MS. KLEER: Okay.

24 Q. I believe, Mr. Craig, these
25 questions, I will direct them to you. If anyone else

1 is more qualified to answer them, fine, but I will
2 begin by addressing them to you.

3 If you look at page 22 of the witness
4 statement and the section on Environmental Persistence,
5 3.1.1, and I am looking at the second sentence in the
6 first paragraph.

7 "In other words, a compound may
8 persistent but will only be
9 environmentally hazardous if the exposure
10 concentrations or doses are present at
11 levels above the respective toxic
12 threshold concentrations for the
13 applicable compound or compounds."

14 What exactly do you mean by the phrase
15 "toxic threshold concentrations", just for
16 clarification.

17 MR. CRAIG: A. In the presentation of my
18 evidence earlier we discussed what we meant by
19 threshold concentration and I referred to threshold
20 effect concentration, and it is the concentration above
21 which one can anticipate an effect and that effect
22 could be in water, in soil, organisms, whichever
23 organism is exposed because I identified that there are
24 concentrations of toxicants which will not elicit an
25 effect; therefore, they would be below that threshold

1 for that compound.

2 Q. So what is the significance of the
3 word "toxic"?

4 A. I've used toxic in a fairly broad
5 sense throughout the presentation of my evidence where
6 I have referred to both acutely lethal responses, which
7 are acute, and also sublethal responses, which could be
8 inhibition of growth or reproduction; any other effect
9 that does not result immediately in death.

10 It may affect the community structure or
11 long-term success of that exposed community, so I have
12 used toxic in this regard to apply to both acute and
13 chronic responses.

14 Q. Okay. If you could turn to page 25
15 and I would like to focus for a moment on the Frank et
16 al study on residues in blueberries, and if we could
17 turn to Exhibit 665 that would help in the course of my
18 questioning.

19 MADAM CHAIR: We have not found our copy
20 of 665, Ms. Kleer. Does anyone have an extra one we
21 could share? You are falling down on the job, Mr.
22 Cassidy.

23 MR. CASSIDY: I need Mr. Shibitani here.

24 MS. KLEER: We have an extra copy.

25 MR. CASSIDY: Do you have an extra one

1 for me, too. -

2 MS. KLEER: Sorry, Mr. Cassidy.

3 MS. KLEER: (handed)

4 MADAM CHAIR: Thank you.

5 MR. CASSIDY: Do the witnesses have it?

6 MR. CRAIG: I don't have one with me.

7 MR. KLEER: I thought I'd referred you to
8 it. I apologize if you don't have one.

9 I can ask my questions -- a few questions
10 before I get to actually referring to the document, if
11 you want to get one done that would assist.

12 Q. Okay, Mr. Craig, this is taking a
13 while. Does the study by Frank et al, which is Exhibit
14 4665, indicate that 2,4-D has been shown to persist in
15 blueberries whether sprayed when the berries are mature
16 or immature?

17 MR. CRAIG: A. I believe it indicates
18 that in this particular situation there was a
19 continuing residue on the berries.

20 My understanding is that 2,4-D can be
21 washed off and removed by rainfall, so I would be
22 somewhat hesitant to suggest that it's a clear
23 indication of persistence, particularly in the light of
24 the other evidence that 2,4-D is degradable.

25 I don't deny that the observation is

1 correct, that Dr. Frank did measure residues on
2 blueberries some 15 days after and they had only
3 declined slightly. So I have no difficulty with that.

4 Q. All right. One further point. Did
5 they persist whether or not the berries were mature or
6 immature when they were sprayed?

7 A. I couldn't tell you offhand.

8 Q. You'd have to look at the study.
9 Okay, we will refer to the study.

10 A. Okay.

11 Q. That's my understanding, I just
12 wanted to confirm that.

13 A. I see.

14 Q. You report in your witness statement
15 that residue of 10.7 milligrams per kilogram in ripe
16 blueberries were found 14 days following treatment of
17 mature berries -- sorry, of immature berries; is that
18 correct?

19 A. Yes, that's my understanding of that.

20 Q. All right. Now, the authors -- I
21 think I'm going to have that copy of Exhibit 665 before
22 we proceed.

23 MR. CASSIDY: I may owe Ms. Kleer an
24 apology. I just looked at the letter she sent me and I
25 simply sent it on to the witnesses and I think I

1 misread it and I think the witnesses might have misread
2 it, to think that Exhibit 665 was something other than
3 what this letter very clearly stated.

4 For that reason, I apologize for the
5 problem involved here.

6 MS. KLEER: Well, okay.

7 MADAM CHAIR: On the Board's part, you
8 can tell Ms. Devaul is away this week, we are running
9 short of exhibits and things.

10 MR. CASSIDY: I mistook the document
11 which Ms. Kleer kindly provided with her letter as the
12 exact exhibit, when in fact it is not.

13 MS. KLEER: Well, why don't we -- I will
14 leave that line of questioning for now, for the moment,
15 and I will go on to page 32 of the witness statement.

16 Q. I will read the first two lines at
17 page 32. This deals with environmental residues in
18 blueberries, but in the context of bear consumption of
19 blueberries.

20 "The environmental residues which may
21 persist in blueberries (as discussed in
22 Section 3.1.1) are unlikely to cause
23 adverse toxic effects to terrestrial
24 herbivores or omnivores. For example, it
25 is estimated that 180 kg black bear

1 with an assumed oral LD50 of 100
2 mg/kg..." the citation there is Weeks et al, 1988,
3 Section 8.5,
4 "...would have to consume 327 kg,
5 on a daily basis, of contaminated berries
6 containing 11 mg/kg of 2,4-D to achieve
7 one-fifth LD50."

8 Can you explain to the Board, Mr. Craig,
9 what it means to achieve one-fifth LD50; in other words
10 what are you using one-fifth LD50 to indicate?

11 MR. CRAIG: A. The one-fifth LD50 was
12 used in the Weeks document as an estimated lower
13 tolerable level dose for many of the mammalian
14 surrogates that they referred to in their -- this would
15 be a hazard assessment or risk assessment of exposure,
16 So we used that same one-fifth and that's not
17 unreasonable. That's an arbitrary estimate of the
18 threshold effect for any acute response.

19 So we used that same one-fifth estimate
20 and we based -- so we had the one-fifth LD50 because it
21 was a representative LD50, we then estimated how
22 many -- what bulk of blueberries would have to be
23 consumed, assuming that they had this residual of 11
24 milligrams per kilogram of 2,4-D. So it becomes a
25 mathematical calculation to determine how many

1 blueberries would supply this large mammal with the
2 dose required to meet the one-fifth of the LD50.

3 Q. You mentioned in your response that
4 the one-fifth LD50 is used only for acute toxic
5 studies; is that correct?

6 A. Well, in reference to the LD50, it
7 would be -- it would certainly provide protection from
8 acute responses, but it would range into some of the
9 sublethal effects as well.

10 Q. But you could presumably have levels
11 lower than the one-fifth LD50 which would achieve -- or
12 which would result in, rather, longer term effects; is
13 that a fair generalization?

14 A. That's always possible. You know, I
15 would prefer to rely on some specific measures of that
16 fraction of LD50 than is represented by some sublethal
17 response, but that's a general statement.

18 Q. Let me rephrase the question. Would
19 you use -- in a typical risk assessment, would you use
20 one-fifth LD50 or LD50 as a standard against which to
21 decide whether or not there are long-term toxic
22 effects, using toxic as you have explained earlier to
23 the Board?

24 A. That -- if I apply the same
25 principles of aquatic toxicology as I might to

1 mammalian toxicology because there are -- there may be
2 some subtle differences in the ratios, but I'am
3 certainly familiar with using ratios such as one-fifth
4 and one-tenth, for instance, of LD50 as an estimate of
5 the maximum acceptable tolerance concentration which
6 represents, again, that threshold, for instance,
7 sublethal effects.

8 So one-fifth is a fraction that has been
9 used in estimating sublethal effect thresholds, other
10 fractions have been used as well, and if you wish to
11 put a lot of weight on that fraction, it is advisable
12 to have an actual reference that identifies the effect
13 concentration for the sublethal threshold and compare
14 that with the LD50 concentration. In general, it is
15 consistent with that estimate of safety required to
16 protect against sublethal effects.

17 Q. In the long term?

18 A. Yes, that's correct.

19 Q. If we could look for a moment at
20 Exhibit 1233, which is the Weeks risk assessment, and
21 turn to page --I believe it is page 317, 3-17 that is.

22 MADAM CHAIR: Are we on page 33, Ms.
23 Kleer?

24 MS. KLEER: Sorry, I'm referring to
25 Exhibit 1233, page 3-17.

1 MADAM CHAIR: Okay.

2 MS. KLEER: Q. I am just going to
3 make -- do you have that in front of you, Mr. Craig?

4 MR. CRAIG: A. Yes, I do.

5 Q. Is there a reference there in the
6 beginning paragraphs to the U.S. EPA provisional
7 acceptable daily intake level for 2,4-D?

8 MADAM CHAIR: I'm sorry, Ms. Kleer, what
9 page are we on?

10 MS. KLEER: 3-17. It would be in the
11 first paragraphs on that page.

12 MR. CRAIG: I'm looking under the
13 subtitle 2,4-DP. Is that what you're looking at?

14 Q. No, I'm sorry. In the second --
15 sorry, in the third paragraph there is a reference. I
16 will read it into the record.

17 A. Yes.

18 Q. What is that provisional ADI?

19 A. ADI. Oh, provisional ADI of .01
20 milligram per kilogram per day.

21 Q. And that level was established on the
22 basis of a chronic feeding study on rats; is that
23 correct?

24 A. Yes. What they did, as I read here,
25 is that they established the NOEL, which is the no

1 observed effect level, that would be my threshold --
2 that would be comparable to my threshold effect
3 concentration, and they used one milligram per kilogram
4 of that estimate and then they applied a hundredfold
5 safety factor to that.

6 Now, that would be a selected factor that
7 is not necessarily -- it's a matter of practice and
8 convention as opposed to demonstrated --

9 Q. That's right, but it's not atypical
10 to use that hundredfold safety factor?

11 A. No, that's not an unusual
12 application.

13 Q. What is the purpose of establishing
14 an ADI level? What I'm trying to relate is ADI levels
15 and LD50s.

16 A. The hundredfold safety factor is used
17 to develop the acceptable daily intake level to allow
18 for any additional uncertainty that reviewers may feel
19 is appropriate in assessing the hazard of that -- or I
20 guess assessing the hazard of that compound.

21 Q. Well, is it true that an ADI level
22 would be used to protect against risks other than
23 cancer, sublethal effects. Is that a purpose for using
24 an -- or for establishing an ADI level?

25 A. Yes, it would be the assumption.

1 Where it is used is to identify a level of consumption
2 that could be continued every day for the life of that
3 organism, so that it would be essentially an upper --
4 a maximum background exposure level, is the way I would
5 see it.

6 So the way I would interpret this is that
7 if the organism -- in this case they're using rats, and
8 I would assume that they would want to extrapolate that
9 to humans in this particular situation and, therefore,
10 they would apply that safety factor. So the assumption
11 would be that if a human were to consume 2,4-D at the
12 rate of .01 milligrams per kilogram every day of their
13 life for, let's say, a 70-year period, that they would
14 not be at any greater risk than if they were to consume
15 zero milligrams.

16 Q. Well, is that correct, though? You
17 are saying everyday of their lives, well rats don't
18 live as long as humans.

19 I mean, is it really true that you have
20 to eat over -- or you have to stay under that level for
21 every day of your life? Isn't it true that if you had
22 for some portion of your life, one than one day, say,
23 you ate greater than the acceptable daily intake
24 level--

25 A. Yes.

1 Q. --would that not be some indication,
2 not a perfect indication, but some indication that the
3 person consuming that would be considered to be at
4 risk?

5 A. To a certain degree. It becomes a
6 little more complicated in that one of the other items
7 that I identified earlier was that exposure was
8 dependent not only on concentration, but also on
9 duration and, therefore, that relationship of
10 concentration and duration would have to be taken into
11 consideration in assessing the risk of exposure.

12 Q. Can you say whether or not there are
13 a certain number of days which one has to exceed the
14 ADI level before one is considered to be at risk? Is
15 there any such certain number, or can you answer that
16 question?

17 A. It would be very difficult for me to
18 answer that. I think theoretically you could, but I
19 don't think that I can.

20 Q. But then you wouldn't say, would you,
21 that one would have to exceed that level every day of
22 one's life in order to be considered at risk?

23 A. Well, what you could say is that the
24 incremental risk to harm would be over, let's say, the
25 background incidence of whatever natural harmful events

1 happen in the course of the life, that the incremental
2 risk would be greater than the background.

3 Q. If you exceeded it for --

4 A. If you exceeded .01, yes. If the
5 individual consumed .02, for instance, then the risk
6 would be incrementally greater.

7 Q. Okay. I would like to relate this
8 discussion back to Frank's study, Exhibit 665, which we
9 now have a copy of, I trust.

10 A. I do.

11 Q. Okay. Now, if we take -- it would be
12 fair to say that there have been, and you have already
13 indicated this, there have been in this study
14 indications that 10 milligrams per kilogram
15 contamination levels have been observed in the field?

16 A. Yes.

17 Q. Now, what quantities of berries
18 contaminated at the level of 10 milligram per kilogram
19 could a person eat to remain under the provisional ADI
20 level of .01 milligrams per kilogram, and assuming 10
21 milligrams per kilogram of 2,4-D?

22 A. So there are 10 kilograms of 2,4-D
23 per kilogram of berrie. And we would have to --do you
24 want to deal with an individual.

25 Q. One person.

1 A. One person. So we will assume that a
2 person is 70 kilograms and we can consume the .01
3 milligrams per kilogram.

4 Q. Does it matter how much the person
5 weighs?

6 A. Oh, yes.

7 Q. Okay. Just go through your
8 calculation, then.

9 A. And therefore their maximum
10 consumption would be .07 kilograms.

11 MR. FREIDIN: How many kilograms, sorry?

12 MR. CASSIDY: .07 kilograms.

13 MR. CRAIG: Pardon me, it would be...

14 MR. CASSIDY: Is it .7 milligrams?

15 MR. CRAIG: .7 milligrams and, therefore,
16 that would be .7 over 10 kilograms of berries which
17 would be--

18 MR. KLEER: Q. Sorry, why --

19 MR. CRAIG: A. --.07. I will just finish
20 this, if I can.

21 Q. All right, and then I will ask you a
22 question.

23 A. And the .7 kilograms of berries which
24 would be 70 grams of berries.

25 Q. All right. So 70 grams of berries

1 could be eaten in a day? ,

2 A. Yes.

3 Q. And you would remain under the ADI
4 level assuming that 70 kilogram person?

5 A. And from the U.S. EPA PDI, I would
6 assume they could do that every day of their life.

7 Q. Well, I thought we had that
8 discussion earlier. Could they do that every day of
9 their life?

10 A. That's my understanding of acceptable
11 daily intake, yes.

12 Q. But if they exceeded that, you have
13 indicated, have you not, that even if they exceeded it
14 for one day they are at some greater risk than the
15 background level of risk?

16 A. That's true. I would anticipate that
17 would be a very small incremental risk.

18 Q. All right, but if you had --

19 A. But it would be an incremental risk.

20 Q. Seventy grams of berries is not a
21 whole lot of berries; is that fair to say? You could
22 certainly eat 70 grams of berries in one sitting? You
23 could eat a lot more than 70 grams of berries in one
24 sitting.

25 MR. FREIDIN: Can somebody tell me what

1 70 grams of berries looks like?

2 MADAM CHAIR: You mean how many cups, Mr.
3 Freidin.

4 MR. FREIDIN: I have no idea.

5 MR. CASSIDY: Something you can order at
6 the restaurant --

7 MR. FREIDIN: I was maybe thinking of
8 buying 70 grams.

9 MADAM CHAIR: I don't know.

10 MR. CASSIDY: Let's ask the only person
11 who can give evidence here.

12 MS. KLEER: All right.

13 Q. What is 70 grams in cups?

14 MR. CRAIG: A. In cups? Well, it will
15 be a non-culinary guess, but my guess is it might be,
16 let's say, a cup of berries.

17 Q. All right.

18 A. It will be a good breakfast feed.

19 Q. So you could certainly eat 70 grams
20 in a day?

21 A. I certainly could.

22 Q. And you could certainly eat more than
23 70 grams in a day?

24 A. Yes.

25 Q. And how long does the berry season

1 last; do you have any idea?

2 A. I don't know. A couple of weeks,
3 maybe, three weeks. I don't know.

4 Q. All right. We don't know, but it
5 certainly lasts more than one day?

6 A. It should, yes.

7 Q. All right.

8 A. I would agree with that, it's my
9 personal experience.

10 Q. Then would it not be fair to say that
11 a person who regularly ate berries as part of their
12 diet could over however long the berry season is, and
13 perhaps longer if they ate frozen berries, be exposed
14 to greater than the ADI level for a period of time
15 every year and they could do this for as many years as
16 they eat berries?

17 A. On a daily basis, that's quite
18 conceivable. But, again, my understanding of the ADI
19 is that it is on a continual basis and that one should
20 average that out over the full period of time, whether
21 it would be on an annual basis or for the lifetime of
22 the individual, so -- and particularly in the case of
23 2,4-D which is excreted and broken down by mammalian
24 systems, I think that's a reasonable consideration.

25 So while one might indeed consume more

1 than 70 grams of berries a day for a certain period of
2 time, it would not exceed, to my guess, it is a guess,
3 that it wouldn't exceed a month, it certainly probably
4 wouldn't exceed a year. But, again, that's just my
5 intuitive feeling at this stage.

6 Q. But you would agree that that person
7 is at risk greater than the background level of risk?

8 A. For those days, yes.

9 Q. Okay. But you can't quantify what
10 that risk would actually mean in terms of health
11 effects?

12 A. No. I think to a certain extent we
13 are really getting into some area that I'm really not
14 an expert in, and that is human health effects and the
15 associated risk assessment that goes to the --
16 assessing the potential for human health hazard.

17 So I'm using some mammalian toxicology
18 extrapolations here and the limited knowledge I have in
19 this area of risk assessment to answer your question.

20 Q. All right. Given that limitation,
21 let's go back to the top of page 32 of your witness
22 statement.

23 A. Yes.

24 Q. And I will read the first sentence
25 again and I will read it slowly.

1 "The environmental residues which may
2 persist in blueberries (as discussed in
3 Section 3.1.1) are unlikely to cause
4 adverse toxic effects to terrestrial
5 herbivores or omnivores."

6 Now, are you saying that adverse toxic
7 effects are only correlated with the lethal dose
8 required to kill 50 per cent of the population? Is
9 that what that sentence it meant to indicate?

10 A. No, because in our assessment we
11 identify -- we make reference to the one-fifth LD50.
12 That would clearly get below lethal effect
13 concentrations.

14 Q. But doesn't one-fifth LD50 mean --
15 well, does one-fifth LD50 mean that you could kill 10
16 per cent of the population, or is that --

17 A. No.

18 Q. That's not what it means, okay.

19 A. That's not it.

20 Q. It is an arbitrary point taken below
21 the LD50 which is meant to provide some safety factor,
22 some unquantified safety factor?

23 A. That's true, it includes a safety
24 factor. The LD50 is a calculated number and, Madam
25 Chair, the LD50 is calculated based on mortality

1 plotted against concentration or dose and, of course,
2 with a number of points on this graph you tend to get a
3 slope, and then there is an intersection developed to
4 estimate the concentration that would result in 50 per
5 cent mortality and that's the concentration -- that's
6 the LD50.

7 If you look at the slope of this dose
8 response line, it would intersect the "x" axis at some
9 point. That is the estimated concentration that would
10 result in no mortality and that fraction might be 50
11 per cent, for instance, one half of the LD50 and that's
12 commonly the case in aquatic toxicology, with which I
13 am most familiar. So that to take some point, such as
14 one-fifth, would represent a concentration lower than
15 the estimated lethal threshold.

16 And in the case of the example with
17 Weeks, there would be some -- that would be used as an
18 estimate to protect against not only lethal effects,
19 but sublethal effects. So that's where the one-fifth
20 comes in.

21 I have seen other fractions used, such as
22 one-tenth, for instance, and -- however, in the case of
23 the other example that we were referring to, I think in
24 the Weeks document, this is Exhibit 1233, there is
25 mention of the NOEL. Now, that then is the estimate

1 and that is a measured estimate of the sublethal
2 threshold effect concentration. And so given that
3 information, it would be appropriate to express the
4 NOEL as a fraction of the LD50 and use that as a
5 calculated measure, safety factor that could be applied
6 to other LD50s for 2,4-D for other mammals. That would
7 be a more reasonable approach.

8 Q. Okay. Would you say that other
9 indicators other than one-fifth LD50, such as the ADI
10 level that we've talked about--

11 A. Yes.

12 Q. --is more applicable to get toxic
13 effects of 2,4-D than is the one-fifth LD50 standard?

14 A. Well, the -- I'm sorry, did you say
15 the ADI?

16 Q. Yes, the ADI level.

17 A. The ADI is more appropriate for
18 continuous daily exposure as opposed to what might be
19 considered more of a pulse exposure in the case of
20 wildlife eating berries because, of course, berries are
21 only available for a limited period in the year and
22 they would not be available for most of the year.
23 So...

24 Q. Yet there are ADIs for blueberries?
25 I mean, those exist.

1 A. For blueberries?

2 Q. Well, you may not know that. Okay.

3 A. I don't know for blueberries, maybe
4 for 2,4-D, but...

5 Q. Sorry. Well, what I'm really trying
6 to get at is, you can use -- you have used one-fifth
7 LD50 as one way of getting at risk. All I am saying is
8 that ADI level is another way of getting at risk?

9 A. That's quite true.

10 Q. And it gets that long-term risk?

11 A. That is for long-term. I would say
12 lifetime exposure, yes.

13 Q. All right. Whereas the LD50 does not
14 really address itself to long-term risk, it addresses
15 itself to acute risks?

16 A. That's true.

17 Q. Now, can you have, or do you know
18 whether -- this may be just a hypothetical, but is it
19 possible to have lethal effects when the level is
20 one-fifth LD50?

21 A. Not to my knowledge.

22 Q. Do you have any idea how much berries
23 bears eat?

24 MR. CASSIDY: Just to assist, I have no
25 idea, but maybe Dr. Eedy might be able to help out on

1 that.

2 Q. Are you aware of any studies that
3 address that?

4 DR. EEDY: A. I know of places where I
5 could probably find the information, but I don't have
6 them readily available.

7 Q. Are they in published studies, to
8 your knowledge?

9 A. They would be in published studies.
10 I can give you a reference, if you want.

11 Q. Only if it's readily available, I
12 would appreciate that.

13 MR. CASSIDY: You got yourself into this
14 one, Dr. Eedy.

15 DR. EEDY: I don't guarantee it would be
16 there, but there are books on Canadian mammals that
17 certainly have the amount of general food that the
18 animal would eat in a day, whether in any particular
19 day that would be all berries or not, I think would
20 depend -- I mean, bears are omnivores, they eat
21 anything that happens to come across their way and they
22 get ahold of, so I don't think a bear would feed on
23 berries and nothing else in one day.

24 I don't think you can come up with an
25 exact number, no.

1 MS. KLEER: Q. Well, is that your final
2 point, you can't come up with studies where they have
3 observed how much berries --

4 DR. EEDY: A. I don't know of any
5 studies that specifically says how many berries a bear
6 eats in a day. I do know of studies that say how much
7 food they would eat in a day.

8 Q. All right.

9 MR. CRAIG: A. If I might pursue this a
10 little further. Just from a mammalian perspective,
11 the larger the animal the less total energy requirement
12 per gram -- or per kilogram of body weight.

13 So typically large mammals are much more
14 conservative of their energy as opposed to shrews which
15 have very high rates of metabolism and tend to eat many
16 times their body weight.

17 Consequently, bears being at the other
18 end of that scale, my suspicion is that because they
19 are very large and have a large body mass that they
20 would probably be unlikely to consume their body
21 weight.

22 Q. That's a suspicion?

23 A. Yes but --

24 Q. Based upon a general principle?

25 A. Yes, that's very true, but I don't

1 think it's unreasonable. It is not exact, but it's not
2 unreasonable.

3 It is on the basis of that that we then
4 calculated the consumption required for the animal to
5 achieve the one-fifth LD50, which is not a lethal
6 level, but below or a less than lethal level. We
7 assumed that compared to a large 180 kilogram bear that
8 was something slightly less than their twice their body
9 weight and that bears were unlikely to consume slightly
10 less than their body weight every day, just because of
11 their size.

12 For instance, cattle, from my
13 observations with cattle on my property, don't consume
14 their body weight in hay and straw and oats every day,
15 nor do horses. Horses can typically consume, let's
16 say, a bail of hay maximum and a pail of oats and
17 that's not the same mass as a horse.

18 Q. One final question on this matter.
19 Do you have any idea what the dose response curve is
20 for bears eating berries consumed -- or berries
21 affected by 2,4-D?

22 A. It would typically be linear, most --

23 Q. But you don't know what the slope of
24 that line is?

25 A. I have not seen that specific data,

1 no.

2 Q. Okay, let's go back to Exhibit 665
3 for a few more questions about blueberries and we will
4 still look at page 22 of your witness statement --
5 sorry, not page 22, page 25.

6 Now, you have indicated in your summary
7 of this paper by Frank et al that:

8 "Frank et al. found residues of 10.7
9 mg/kg in ripe blueberries 14 days
10 following treatment of immature berries
11 with 2,4-D at 3.0 kg/ha."

12 You characterized those residues
13 declining slightly; i.e., to 7.93 milligrams per
14 kilogram over the next 15 days.

15 Now, if you turn to page 202 of Exhibit
16 665, on the right-hand column, would you agree that the
17 authors of this report characterized that decline as
18 being only a slight decline?

19 The sentence I'm referring to says:

20 "The first ripe fruit contained 10.7
21 mg/kg and this declined only slightly
22 over the next 15 days."

23 My question is, do you agree with that
24 characterization? Is that only a slight decline?

25 A. Yes, I believe our reference to that

1 was essentially a decline from, let's say, 11 to 8
2 milligrams over 15 days which they considered slightly,
3 they called it slightly.

4 Q. And you agree that it is only a
5 slight decline?

6 A. Yes, under -- this is a comparison of
7 their field observations.

8 Q. Can we look at Table 7 in Exhibit 665
9 which is at page 206 and look at the data for
10 Chappise - I believe that's how one would say it -
11 Sudbury. Now, this is an indication where ripe berries
12 were sprayed, is that correct, as opposed to immature?

13 A. Yes.

14 Q. Okay. Now, at day one, if one looks
15 over at the last two columns, the residue was 3.29
16 milligrams per kilogram; is that correct?

17 A. That's correct.

18 Q. And is it not true that that residue
19 increased to approximately 8 milligrams per kilogram
20 over the course of the remaining -- up until day 27?

21 A. That's what the data -- the mean
22 concentration increases, certainly, yes.

23 Q. So not only does this paper indicate
24 that residues can persist, but they can actually
25 increase to a certain level; is that correct?

1 A. I would be hesitant to jump to that
2 conclusion. I would have to review this again, but I
3 would think there would have to be some reason for it
4 to increase. I just can't --

5 Q. But it did increase?

6 A. Well, that's what the data says, but
7 the laws of mass balance dictate that that's a logical
8 inconsistency.

9 Q. Well, let's look at the data that
10 follows. For Catherine, McElroy and Timiskaming, day 3
11 level was 3.16 milligrams per kilogram and that
12 increased on day 9 to 6.39 and from there on you have
13 variations up until day 37?

14 A. I think it would be important to look
15 at the standard deviations on the next right-hand
16 column, and the standard deviation indicates that there
17 is some fluctuation in the individual measured values
18 and, indeed, if one were -- let's go back to the
19 original case you discussed, and that is the berry year
20 of 1980 in Chappise, where the day one spray value was
21 3. -- let's say 3.3 with a standard deviation of one,
22 which means that the berry samples measured could range
23 from, let's say, 2 milligrams per kilogram to 4
24 milligrams per kilogram based on that standard
25 deviation, and on the 27th day the samples measured

1 ranged from 8.3 with a standard deviation of 4.6 which
2 means that they could be as low as that difference
3 which would be 8.3 and 4.6.

4 Q. And the difference there is?

5 A. Which means some of those samples
6 could be quite low.

7 Q. How low is quite low?

8 A. I am sorry?

9 Q. How low is quite low?

10 A. Well, quite low is 3.7. So you will
11 be comparing 3.7 with the upper range of day 1 of 4 and
12 on the basis of statistical comparison, one would say
13 that those days, the concentrations of 2,4-D on those
14 samples collected on day 1 and day 27 were not
15 significantly different, and that's on the basis of
16 comparing means with only one standard deviation which
17 represents 66 per cent of the time as opposed to a
18 comparison with two standard deviations which gives you
19 a confidence level of 5 per cent, which would be the
20 more proper way to do it.

21 So I would suggest to you that while the
22 mean do, indeed, increase and they do appear to be
23 quite different, statistically, based on the standard
24 deviations, they are not. They are the same.

25 Q. But did you not say that taking the

1 mean on the 27th day for the Chappise, Sudbury site
2 your lowest could be 3.7?

3 A. Mm-hmm, that's correct.

4 Q. Now, couldn't you on day 1? Your
5 lowest was two; isn't that right?

6 A. That's true.

7 Q. So that you could actually have --
8 your lowest on day 1 was lower than your lowest on day
9 27?

10 A. Well, on an individual sample basis,
11 yes, that's true. But, in fact, in order to conduct
12 this kind of comparison using statistics, one must take
13 into consideration all of the measurements and one must
14 look at the population of concentrations for both day 1
15 and day 27.

16 To make that comparison statistically,
17 one has to determine whether or not there is an overlap
18 in that population value and so, therefore, it is
19 unreasonable to just to use two separate sample
20 measurements from those two different days. You have
21 to use the whole population of data and the simple way
22 to make that comparison, as I indicated here, is to
23 take the mean, subtract the standard deviation from the
24 highest value, add the standard deviation to the lowest
25 value.

1 If there is an overlap of those bell
2 curves, then statistically those two samples are deemed
3 to be not significantly different. The means may
4 differ, but the variation for each of those means is
5 sufficiently wide as to determine that the confidence
6 of those different -- the confidence that you have
7 those differences are real is not sufficiently high for
8 them to be in fact real.

9 So simply stated, those differences are
10 not significantly significant.

11 MADAM CHAIR: Is there any plausible
12 explanation, Mr. Craig, why there would be an increase
13 in residue levels subsequent to spraying?

14 MR. CRAIG: It would primarily be driven
15 by how the sample was collected and where the sample
16 was collected. For instance --

17 MADAM CHAIR: Were these sprayed
18 intentionally for this study or they went into areas
19 that had been sprayed?

20 MS. KLEER: I think they went into areas
21 that had been sprayed, but...

22 MADAM CHAIR: So there was no analysis of
23 possible residues before spraying?

24 MS. KLEER: I honestly wouldn't be able
25 to answer that.

1 MR. CRAIG: Well, the pre-spray -- Madam
2 Chair, the pre-spray condition in this example, 1980
3 Chappise was non-detectable, so in that case there was
4 no 2,4-D present before day 1, according to this data,
5 and there were -- the same five samples were collected.

6 So one would assume that the standard
7 deviation really reflect the sampling error and while
8 there -- and that is sampling and analysis and
9 measurement, and all of those sources of error.

10 Sy what this data tells me is that the
11 concentration of 2,4-D did not significantly change
12 between day 1 and day 27.

13 Q. So it did persist, then, and it may
14 have increased? You are looking --

15 A. It would remain inconsistent, I
16 wouldn't agree that it increased, no.

17 Q. All right. And your statistical
18 analysis of that is only pertaining to that one
19 particular Chappise, Sudbury site; is that correct?

20 You would have to do a separate analysis
21 for each site to determine whether for each site there
22 was actually an increase or whether the residues
23 remained relatively constant?

24 A. Yes... I would be careful of jumping
25 to the conclusion that there had been an increase in

1 the concentration just -- as I said from the laws of
2 mass balance, I don't know how one can measure greater
3 concentrations of 2,4-D in an area of application if no
4 more than that amount of 2,4-D is placed there.

5 Q. What if berries -- what if the water
6 content of the berries decreases slightly, would that
7 be one --

8 A. Yes, that's possible. That would be
9 an explanation.

10 Q. Now, if we turn to page 204 of
11 Exhibit 665 at the top. Now, the authors report that:

12 "At only one of the eight sites did the
13 initial residues decline and this was the
14 site with the highest initial residue of
15 17.1 mg/kg, and in 21 days the residue
16 had declined to 1.63 mg/kg."

17 Can you confirm that that's what the
18 authors report?

19 A. Yes, that's in the report.

20 Q. In your witness statement you make
21 reference to -- pardon me. Excuse me for a moment.

22 Would you agree that persistence in the
23 year of spraying of ripe blueberries is a significant
24 potential exposure route for people who eat
25 blueberries, or leads to significant potential exposure

1 route?

2 A. Well, this data clearly indicates
3 that the 2,4-D can remain on berries for - an example
4 we discussed earlier - 27 days.

5 Q. So my question is, is that
6 significant in your opinion from a potential exposure
7 perspective?

8 A. It would be difficult for me to
9 conclude that from a human health perspective. I'm
10 just reticent to get into that area of human health
11 risk assessment. Certainly, it clearly indicates that
12 there are some 27 days of opportunity for exposure for
13 anybody or anything who wishes to take those
14 blueberries.

15 Q. Okay. Can we look at your statement
16 again at page 25 that:

17 "Ripe blueberries collected from a
18 treated area one year post-spray
19 contained no detectable residues of
20 2,4-D."

21 Would you not also agree that the report
22 indicated that on four of the five plots in the conifer
23 release spray block that there were in fact no
24 blueberry plants. So that that one crop where in the
25 year following spraying there were no detectable

1 residues of 2,4-D is one only one plot of the five
2 plots that they looked at?

3 A. I would have to recheck that. Would
4 you like to refer me to some specific area?

5 Q. Yes, on page 204, the fourth
6 paragraph, just before the heading Pin Cherry?

7 A. Yes.

8 Q. So, then, does that not indicate that
9 only one of the five plots actually had ripe berries in
10 the year following spraying?

11 A. Yes, the article indicates that
12 blueberry plants were absent from four of the five
13 plots, yes. So that would be one of the reasons.

14 Q. So this report really only gives you
15 information about potential year to year persistence
16 for just one plot; is that correct?

17 A. Yes, for that plot.

18 Q. Now, on the basis of the results from
19 that one plot, you would not be able to give any
20 opinion as to the likelihood or lack of likelihood of
21 year to year persistence or 2,4-D; would you?

22 A. Well, I've used other information to
23 comment on the persistence of 2,4-D and that other
24 information relates to 2,4-D being in close proximity
25 to other organisms, bacteria that do carry out the --

1 that are responsible for the natural degradation
2 process and, therefore, I would not rely on that
3 information alone to characterize the persistence of
4 2,4-D.

5 So it's my understanding that 2,4-D does
6 degrade and it will degrade in the presence of bacteria
7 and moist and warm soil conditions, and I would also
8 anticipate that where blueberry plants are sprayed,
9 that the berries would fall to the ground, the leaves
10 would fall to the ground and there would be and
11 opportunity for that kind of microbial degradation
12 possess. So I don't find it surprising that 2,4-D was
13 not measured in the following year.

14 MADAM CHAIR: Ms. Kleer, wasn't the
15 evidence from Dr. McCormack that it would be unusual to
16 have blueberries a year following spraying?

17 MS. KLEER: That you would find
18 blueberries growing on plants following spraying?

19 MADAM CHAIR: Yes, they would be caught
20 in the release program. And I think the evidence
21 before the Board is that it would be likely be two
22 years after spraying before you would have berries
23 available for picking.

24 MS. KLEER: That may be your
25 recollection, I honestly can't recall.

1 Q. Have you seen any studies that
2 examine spraying in one year, other than this, spraying
3 in one year and then what happens with respect to
4 berries in the year following, whether or not there are
5 levels of 2,4-D found in those berries?

6 MR. CRAIG: A. I can't recall that I
7 have seen that information.

8 Q. So you don't know?

9 A. I don't know.

10 MADAM CHAIR: Mr. Craig, do you have any
11 information on the levels of 2,4-D residue on fruit in
12 supermarkets or fruit grown on farms?

13 MR. CRAIG: Again, I don't offhand. I'm
14 sorry.

15 MR. MARTEL: Would you anticipate berries
16 in the second year -- if you sprayed one year, would
17 you anticipate berries on the growth next year of the
18 berries themselves?

19 MR. CRAIG: Again, I have difficulty
20 answering that. I guess I would have to say I just
21 don't know. I'm not familiar with how plants are going
22 to respond in that situation.

23 I would -- if the plants do berry, and I
24 am unsure as to whether they would the next year, my
25 feeling is that if there was no spraying in that second

1 second year, that the only way for the plants to
2 translocate the herbicide from the -- would be from the
3 ground from leaf litter and berry litter and whatnot,
4 back up through the plant into the berry in the second
5 edition, and I would think that if the 2,4-D levels
6 were sufficiently high, of course that would retard any
7 development of the plant.

8 But if there were residue levels, then
9 there would be an opportunity for that translocation,
10 but I would suggest that the opportunities for natural
11 degradation in the process of defoliation as a natural
12 fall process and spring and winter degradation
13 processes would preclude that, but it's a logical
14 exercise I'm going through as opposed to a matter of
15 fact.

16 MS. KLEER: Q. All right. If we could
17 switch focus here and I would like to talk for a moment
18 about bioconcentration factors and I would like to turn
19 to page 23 do to that. Again, I believe, Mr. Craig,
20 this would be your area; is that correct?

21 MR. CRAIG: A. Yes.

22 Q. All right. At page 23, in the second
23 paragraph, you write that:

24 "The American Society for testing the
25 materials in 1978 indicated that only

1 when the BCF values exceed a level of
2 about 100 are compounds considered to be
3 a potential threat to the organism or
4 the ecosystem."

5 I would like to at this point to
6 introduce just an excerpt from the ASTM report that is
7 referred to here.

8 MADAM CHAIR: Ms. Kleer, I don't know if
9 we told you about our change in hours, from nine until
10 four, when you finish this point we can take a quick
11 break maybe.

12 MS. KLEER: Okay.

13 MADAM CHAIR: Thank you.

14 MS. KLEER: Q. Now, can we turn to page
15 224 of that excerpt.

16 We need to get an exhibit number for
17 that.

18 MADAM CHAIR: I think this is 1259. Yes,
19 1259.

20 Could you read the title into the record,
21 Ms. Kleer.

22 MS. KLEER: The title is Estimating the
23 Hazard of Chemical Substances to Aquatic Life, and I've
24 attached an excerpt which is pages 244, 248 and 249.

25 MR. FREIDIN: Can you indicate on the

1 record what the source is as well, please.

2 MS. KLEER: The source is ASTM Special
3 Technical Publication 657.

4 MR. FREIDIN: Thank you.

5 ---EXHIBIT NO. 1259: Excerpt from a document entitled
6 Estimating the Hazard of Chemical
Substances to Aquatic Life.

7 MS. KLEER: Q. Now, if we turn to page
8 244, isn't it true that the ASTM itself has indicated
9 in this paper that these criteria; i.e., the BCF
10 values, are simply criteria to aid the exercise of
11 flexible good judgment; is that correct?

12 MR. CRAIG: A. Could be, but --

13 Q. It's at the bottom of the page. The
14 second sentence to the last sentence.

15 A. Yes, I see that.

16 Q. So would you agree that the BCF
17 standard or value of a hundred doesn't constitute an
18 absolute standard; in other words, can you really
19 conclude if a BCF is less than a hundred that that
20 compound will not constitute any threat at all, given
21 the comment that the ASTM has made about using it for
22 flexible good judgment?

23 A. Yes, that's reasonable. I think the
24 term you use "threat", again could be used in a broad
25 context and a threat could be from an acute exposure or

1 from a chronic exposure. So that's not unreasonable.
2 They are recommending that ratio and that BCF as a
3 guideline, as a trigger for further consideration.

4 Q. Yet your statement says:

5 "Only when the BCF values exceed a level
6 of about 100 are compounds considered
7 to be a potential threat to the organism
8 or the ecosystem."

9 Given what you've said, isn't that
10 overstating the case?

11 A. Well, I've used that sentence in the
12 context of considering bioaccumulation effects which
13 are -- I consider them different from a direct exposure
14 effect. So the sentence out of context perhaps could
15 be criticized the way you have.

16 However, in the context of this section,
17 I don't think it's unreasonable because I've used the
18 term potential and I'm using it as a guidance
19 indicator.

20 Q. Now, if we can turn to page 248 of
21 the excerpt, Exhibit 1259.

22 A. Yes.

23 Q. Unfortunately I don't have my marked
24 copy, but I shall try to find the section. Yes, at the
25 bottom, third sentence from the end:

1 "Correlation of bioconcentration data
2 for many chemicals has led to the
3 conclusion by many researchers that when
4 bioconcentration factor is less than 100,
5 there is no significant
6 bioconcentration."

7 Now, you have said again referring to
8 your statement, that if the bioconcentration factor
9 exceeds a hundred only then is the compound considered
10 to be a potential threat to the organism or ecosystem.

11 Given the statement that we've just read,
12 basically saying that there is no significant
13 bioconcentration if bioconcentration factor is less
14 than a hundred, is your summary statement at page 23 of
15 your witness statement really an accurate depiction of
16 what BCF means -- or, sorry, what BCF of a hundred
17 means?

18 A. Well, I don't feel that it's critical
19 to place a great deal of focus on the 100 value. I
20 think it's a good guideline, the information that is
21 presented in this ASTM document has discussed
22 correlation.

23 It, in my view, is a trigger and it will
24 indicate whether a compound is likely to bioaccumulate
25 to the food chain, for instance, or not and the 100 --

1 statement. Page 58 indicates:

2 "Bioconcentration factors reported for
3 fish include: 235..." that's tissue
4 lipid content; 339 tissue lipid content in killifish;
5 and 246 in top mouth gudgeon.

6 Now, given your statement and your use of
7 the word -- or use of the hundred BCF standard as being
8 a guideline, would you agree that fenitrothion is able
9 to -- sorry, fenitrothion is available to
10 bioconcentrate to a degree where there is a potential
11 threat to the species that are indicated here?

12 A. What those numbers would tell me is
13 that, since they are above that 100 guideline level, it
14 would be important to consider further evaluation to
15 determine if that compound did indeed persist in those
16 organisms for likely periods of time, primarily; and,
17 secondly, whether this compound - in this case
18 fenitrothion - could be transferred in the food chain
19 and would bioconcentrate or biomagnify in the food
20 chain.

21 So, for instance, these numbers would
22 indicate to me that I should look at higher trophic
23 level animals that would consume these types of
24 animals, have been exposed to fenitrothion, to
25 determine if I would see higher body burden

1 concentrations in those predators. That's what it
2 would tell me.

3 It is not conclusive, but it's a clear
4 suggestion that with this evidence one should look
5 further.

6 Q. Okay. I will like to introduce now
7 an exhibit from the Gloss -- an exhibit that is a paper.
8 by Gloss and Biddinger entitled Comparison of System
9 Design and Reproducibility to Estimate Bioconcentration
10 of Di-n-hexylphthalate by Daphnia magna.

11 I'm sorry. I have forgotten, you wanted
12 to take a break.

13 MADAM CHAIR: I guess we should. It is
14 convenient now, or do you want to finish with this
15 exhibit?

16 MS. KLEER: Perhaps I can just finish
17 with the bioconcentration factors.

18 MR. FREIDIN: I am just wondering whether
19 you could also read in the source of the document and
20 perhaps the pages of the excerpt.

21 MS. KLEER: Yes, I will. It is taken
22 from Aquatic Toxicology, 7th symposium in 1985 and,
23 again, that's an ASTM symposium.

24 MR. FREIDIN: The excerpt are pages 203
25 to 213?

1 MS. KLEER: That's correct.

2 MR. FREIDIN: Thank you.

3 MADAM CHAIR: Mr. Freidin is particularly
4 inquisitive about exhibits because we have asked the
5 proponent to put his and her minds to coming up with a
6 master list in perfect detail that all of the parties
7 will agree is the exhibit list.

8 MR. FREIDIN: I was just hoping that
9 whatever that task comes out to be that it will end
10 with some exhibits to go. We won't have to do it if we
11 can make sure that we follow a system and we get a full
12 description of the document from now on.

13 MADAM CHAIR: We could also agree on a
14 description of the contents of the document at the same
15 time, Mr. Freidin, or shall we wait on that one?

16 MR. FREIDIN: I think we should wait on
17 that one.

18 MADAM CHAIR: This is Exhibit 1260.

19 ---EXHIBIT NO. 1260: Paper entitled Comparison of
20 System Design and Reproducibility
21 to Estimate Bioconcentration of
22 Di-n-hexylphthalate by Daphnia
magna, by Steven Gloss and
Gregory Biddinger.

23 MS. KLEER: Q. Now, can you turn to the
24 bottom full paragraph on page 203, and I will read it
25 into the record.

1 "The design of laboratory microcosms to
2 identify and quantify sources of
3 accumulated chemicals in various
4 organisms presents a substantial
5 challenge to the researcher. Designs
6 which mimic a complete ecosystem are
7 purported to estimate what has been
8 called ecological magnification under
9 laboratory conditions."

10 And the sentence I would like to focus on
11 is the next one:

12 "Variously designed simple exposure
13 systems may produce very different
14 BCFs for the same chemical and the same
15 organism."

16 Do you agree with that statement, Mr.
17 Craig? Are you familiar with this problem?

18 MR. CRAIG: A. Yes, I agree with that.

19 Q. So you would agree that depending
20 upon the design of the exposure system used to
21 determine the BCFs that we've looked at, that you could
22 obtain perhaps different BCFs for topmouth gudgeon,
23 killifish, any species you look at?

24 A. Oh, yes. That's driven by the
25- inherent characteristics of the organisms and lipid

1 content, for instance, is one. So I wouldn't be
2 surprised to see different bioconcentration factors for
3 different organisms.

4 Q. So would you agree that if you just
5 look at one reported BCF value that may not necessarily
6 tell you the trueability of that particular species to
7 bioconcentrate the chemical?

8 A. That's true, yes. I would suggest,
9 though, that an important consideration here is that
10 the bioconcentration factors are generally expressed in
11 logarhythmic terms because that's how they tend to
12 respond in the real world.

13 So that I would anticipate that the BCF
14 measure for one compound using one organism, where it
15 measured using another organism, would be within the
16 same order of magnitude and, therefore, I would expect
17 a BCF for one organism that registered at somewhere
18 between 10 and 100, that measured for another organism,
19 should fall within that same order of magnitude, for
20 instance, or at least within that logarhythmic order of
21 magnitude.

22 Q. All right. Did you in your witness
23 statement record any reported BCF values for common
24 fish species found in the area of the undertaking?

25 A.- I would have to refer back here. I

1 think we have for some compounds --

2 Q. Well, I'm talking -- let's talk
3 about--

4 A. Fenitrothion.

5 Q. --fenitrothion.

6 A. Okay.

7 Q. I didn't see any in my review but I
8 just wanted to confirm that with you.

9 A. Well, we do have Daphne culex.
10 That's not a fish, but it's an organism.

11 Q. But no fish?

12 A. No, I guess I don't have any unless I
13 have something else. I don't believe so.

14 Q. Well, isn't it true that BCF
15 values are pretty specific to a species, or at least
16 within orders of magnitude they are specific to a fish
17 species?

18 A. Well, what I'm saying is that if a
19 number of fish species were -- if the bioconcentration
20 factor for a number of fish species was determined, all
21 of those bioconcentration factors should be within an
22 order of magnitude of one another.

23 Q. All right. But I'm talking about if
24 you have a particular fish species, don't you have to
25 have some idea what the BCF is for that particular

1 species; in other words, you can't say because
2 killifish has 235 or 339 that you would expect the same
3 for rainbow trout?

4 A. What I can say is that the rainbow --
5 I would say that the rainbow trout BCF would lie
6 somewhere between a half order of magnitude higher and
7 a half order of magnitude lower. It would lie
8 somewhere in that range.

9 Q. Than any other fish?

10 A. Yes.

11 Q. On what basis do you say that?

12 A. Experience, observations, reading the
13 literature, conducting tests. I have actually
14 conducted tests to calculate bioconcentration factors.

15 Q. So that rainbow trout then could be
16 higher than 300 -- the BCF for rainbow trout could be
17 higher than...

18 A. Yes.

19 Q. All right. That concludes my
20 questions on BCF, so perhaps we can take a break.

21 MADAM CHAIR: When will your
22 cross-examination be finished, Ms. Kleer?

23 MS. KLEER: Unfortunately it took longer
24 than I anticipated. I suspect it will take me two
25 hours more to complete.

1 MADAM CHAIR: All right. Why don't we
2 take a break at this point and come back then.

3 Mr. Cassidy, I assume you have spoken to
4 Mr. Cosman about Panel 10.

5 MR. CASSIDY: I have been keeping him
6 updated at each break, Madam Chair. I have notified
7 him that it is not likely until tomorrow afternoon we
8 will get started --

9 MADAM CHAIR: It won't be tomorrow
10 afternoon.

11 MR. CASSIDY: It won't.

12 MADAM CHAIR: It won't be until next
13 week.

14 MR. CASSIDY: I will pass that on to him.
15 I was not in a position, as you've just indicated now,
16 to unilaterally make that decision on my own. So I
17 will tell him that his witnesses can go home, with the
18 Board's permission.

19 They have been in town waiting to start
20 since last night, so I am going to advise Mr. Cosman
21 with your permission that those witnesses can depart
22 and be prepared to proceed the following week.

23 MADAM CHAIR: Yes. Thank you, Mr.
24 Cassidy.

25 ---Recess taken at 3:10 p.m.

1 ---On resuming at 3:35 p.m.

2 MADAM CHAIR: Please be seated.

3 MS. KLEER: Q. All right, moving right
4 along, so we can get this done.

5 Dr. Eedy, I will have a few questions to
6 you with respect to carbaryl effects on soil organisms,
7 and at this point I would like to introduce two
8 different studies which we will be introducing as
9 exhibits.

10 DR. EEDY: A. I think if it is toxic
11 effects you should address them to Mr. Craig.

12 MADAM CHAIR: Exhibit 1261 will be -- it
13 is entitled The Effect of Some Pesticides on the Soil
14 Invertebrate Fauna in the South Taiga Zone in the Perm
15 region, (USSR), authors Voronova, V-o-r-o-n-o-v-a, and
16 it is published in Pedo...

17 MS. KLEER: Pedobiologia.

18 MADAM CHAIR: Pedobiologia 1968.

19 ---EXHIBIT NO. 1261: Paper entitled The Effect of Some
20 Pesticides on the Soil
21 Invertebrate Fauna in the South
22 Taiga Zone in the Perm region
(USSR), authored by L. Voronova,
1968.

23 MADAM CHAIR: The second exhibit is
24 Exhibit 1262 entitled Relative Toxicities of Chemicals
25 to the Earthworm Eisenia Foetida, published in

1 Environment Toxicology and Chemistry 1984, author,
2 Roberts and Dorough.

3 ---EXHIBIT NO. 1262: Paper entitled Relative
4 Toxicities of Chemicals to the
5 Earthworm Eisenia Foetida, 1984,
6 authored by Brian L. Roberts and
7 H. Wyman Dorough.

8
9 MS. KLEER: Q. Dr. Eedy, I think my
10 first question should be addressed to you. Could you
11 briefly explain for the Board the role --

12 MR. MARTEL: Could we just slow down for
13 one moment.

14 MS. KLEER: Sorry. Pardon me.

15 Q. Dr. Eedy, could you briefly explain
16 for the Board the role that soil invertebrates,
17 including earthworms, play in nutrient cycling in
18 forestry -- sorry, in forests, and primarily what I
19 want you to address your answer to is whether or not if
20 one lost a substantial portion of the population of
21 soil invertebrates would that be a serious effect, a
22 serious negative effect?

23 MADAM CHAIR: Are we referring to the
24 witness statement, Ms. Kleer?

25 MS. KLEER: No, I'm referring just

1 generally.

2 DR. EEDY: I think we really have not in
3 our witness statement gotten into the nutrient aspects
4 or into soil invertebrates.

5 MS. KLEER: Q. Well, you certainly have
6 given some evidence about earthworms and behavioural
7 and histological effects of carbaryl on earthworms.

8 So I'm just asking generally in your
9 experience as a biologist.

10 A. Again, if the Board wishes I can
11 certainly talk to a certain extent about that. I'm not
12 an invertebrate biologist. My experience is primarily
13 with mammals and other higher vertebrates. I think I,
14 maybe about 20 years ago, taught a course in
15 invertebrate biology and if I can remember back that
16 far.

17 Q. This is a general biological
18 knowledge question.

19 A. Well, I know soil invertebrates do
20 have some role in breaking down the litter and
21 returning materials, nutrients to the soil.

22 Q. And is that an important role in the
23 forest?

24 A. As to the exact amount as compared
25 to, say, bacteria and other organisms that breakdown

1 the soil litter, I am afraid that's outside of my area
2 of expertise.

3 Q. If you lost a substantial portion of
4 the soil invertebrate population, would you be able to
5 say that that would be a negative effect, a serious
6 negative effect? Say yes or no, if you can't answer
7 it.

8 A. As to the seriousness, I couldn't say
9 yes or no, but I'm certain there would be an effect.
10 Again, my question is -- would be that I do not know
11 how much of the litter breakdown is due to the
12 invertebrates and how much is due to bacteria, yeasts
13 and moulds and a whole variety of other things that do
14 break down the litter in the soil.

15 Q. All right. Well, if I can't get any
16 further I will just proceed.

17 In your witness statement at page 62 you
18 refer to a paper by Gupta and Sundaram.

19 MR. CRAIG: A. Yes.

20 Q. And that paper indicated that
21 behavioural and histological effects of carbaryl on
22 earthworms in lab studies following application of
23 carbaryl have been noted.

24 Could you briefly explain to the Board
25 what those effects, especially the behavioural effects

1 are?

2 A. In the case of behaviour effects,
3 typically it's -- where the doses are sufficiently high
4 and therefore would elicit the toxic response, there
5 would be difficulty in locomotion, in some cases
6 spontaneous curling and abnormal behaviour such as
7 that. So it would limit the earthworm in this case to
8 proceed on its natural way. It limits its locomotory
9 capability.

10 Q. Did you in your witness statement or
11 in your review prior to completing your witness
12 statement review any studies which indicated negative
13 effects on earthworms and other soil invertebrates
14 after a field application of carbaryl?

15 A. No, we did not find any additional
16 articles in that area, although I have since received
17 several from yourself, I believe.

18 Q. All right. Then let's turn to the
19 first one of those, Exhibit 1261, the article by
20 Voronova.

21 A. Yes.

22 Q. Now just to summarize, following
23 spraying with Sevin, which is carbaryl, in both liquid
24 and dust formulations, the author of this report
25 conducted a census of a variety of soil invertebrates;

1 is that correct?

2 A. Yes.

3 Q. Could you turn to page 510. Did the
4 author find that Sevin decreased the total number of
5 soil invertebrates by half as compared to the checks,
6 and that's focusing on the paragraph that begins --

7 A. Oh yes, I see that. That's the
8 statement, yes.

9 Q. Okay. And with respect to earthworms
10 they were also reduced substantially; is that correct?

11 A. Yes, earthworms were reduced by two
12 and a half times.

13 Q. Did this effect persist in the year
14 following treatment with respect specifically to
15 earthworms according to this study? I am looking at
16 the next paragraph.

17 A. Yes, they reported that the
18 population density of earthworms could not attain its
19 original level.

20 Q. All right.

21 A. So it had increased slightly.

22 Q. Sorry, it had...?

23 A. The earthworm population would have
24 increased slightly--

25 Q. But it did not --

1 A. --by about 20 per cent.

2 Q. But it did not attain its -- it was
3 not as high as what it was on the check plots?

4 A. That's true.

5 Q. If we turn to page 514 and focus for
6 a moment on the surface dwelling beetles. Did the
7 populations of surface dwelling beetles also decrease
8 significantly on the sprayed blocks as compared to the
9 checks?

10 A. I'm sorry, were you referring to the
11 table or...

12 Q. I am just referring to the paragraph
13 that begins:

14 "The plots treated with a Sevin
15 suspension..."

16 A. I see.

17 Q. And in fact didn't they find that
18 after treatment a lot of killed Carabids,
19 C-a-r-a-b-i-d-s, which is a type of beetle, and dung
20 beetles were discovered on forest passage-ways with
21 evident traces of Sevin?

22 A. Yes, that's in the report.

23 Q. Well, in your opinion, given the
24 results of this study, would you expect to see similar
25 reductions or at least reductions in earthworm

1 . populations and another soil-invertebrate species
2 sprayed with carbaryl in the area of the undertaking?

3 A. That would very much depend on the
4 dose that area would receive, and I think that's an
5 important consideration in the evaluation of this
6 report.

7 And I believe they mention on page 509 of
8 Exhibit 1261 that the applied concentrations in this
9 study were equivalent to .3 and .5 grams per square
10 meter, which is comparable to 3 and 5 kilograms per
11 hectare which compared to the concentrations that would
12 be anticipated -- or would be approved. The 3
13 kilograms per hectare would be 3.5 times higher than
14 that approval rate, and the 5 kilograms per hectare
15 would be 5.9 or almost six times higher than approved
16 rate.

17 So I don't dispute the findings of this
18 paper, but I would suggest that if the rates of
19 application were lower, then I would expect less effect
20 perhaps, perhaps even no effect.

21 So I would not directly extrapolate the
22 responses reported in this paper to what one would
23 anticipate in a normal spray application.

24 Q. Are you aware of any studies that
25 study the effects of carbaryl on soil organisms, soil

1 micro-organisms given present application rates?

2 A. Only additional material that has
3 come to me recently, and let me just check. Again, it
4 would have to be extrapolations. I don't know of any
5 studies of soil invertebrates after an approved
6 application rate, no.

7 Again, I would have to make
8 extrapolations based on toxicity, the toxicity of these
9 chemicals to specific organisms and relate that to
10 anticipated dosage levels in field after a spray
11 application.

12 Q. So at this point you just don't know
13 and you haven't seen any evidence that tells you about
14 the effects of carbaryl on soil micro-organisms --
15 sorry, soil invertebrate, not micro-organisms?

16 A. At this stage no, without going
17 through that exercise that I just described, comparing
18 the actual, the measured laboratory sensitivity to
19 expected application rates in the field. So it would
20 be a logical exercise, it's not a direct observation.

21 Q. And you haven't seen any field
22 studies either that have examined it?

23 A. No field studies.

24 Q. Can we turn to page 517 of Exhibit
25 1261 and I will read a portion of that first full

1 paragraph.

2 "According to the data given by Edwards
3 in (1965), sevin persists in soil for
4 about six months (at the dose of 1.7-
5 2.2 kg/ha. Some authors state that this
6 compound..." carbaryl or Sevin,
7 "...does not lose its toxicity to
8 earthworms even after a year's
9 period..." and they refer to a paper by
10 An Der Lan und Aspöck, 1962, which I looked at the
11 reference and it is a German paper so I didn't get it.

12 "They consider it to be one of the most
13 dangerous chemicals for earthworms."

14 Are you familiar with that concern about
15 the dangerousness of carbaryl to earthworms?

16 A. No, I'm not and I would still want to
17 pay careful attention to the dose applied. It's a
18 concentration dependent relationship, it's not just
19 that that chemical as applied. So that would be my
20 concern in the interpretation.

21 Q. All right. Can we turn to the paper
22 by Roberts and Dorough, Exhibit 1262. I take it from
23 your comments earlier, Mr. Craig, that you had not seen
24 this paper prior to my sending it to you?

25 A. That's correct.

1 Q. Now, I just want to summarize again.

2 Was this study's purpose to gain information on
3 toxicity of various chemicals to a particular earthworm
4 called Eisenia Foetida because this species was seen to
5 be -- have excellent potential as a representative test
6 organisms for earthworms? Is that your --

7 A. That's what the authors described on
8 page 69--

9 Q. All right.

10 A. --under Results and Discussions, yes.

11 Q. This report provides results of a lab
12 study to identify acute toxic effects of ninety
13 chemicals on this particular earthworms species; is
14 that correct?

15 A. Yes, that's correct.

16 Q. And the authors describe a
17 classification system for toxicity in which a substance
18 was designated as being super-toxic if the LD50 was
19 less than 5 milligrams per kilogram, extremely toxic if
20 the LD50 was 5 to 50 milligrams per kilogram, very
21 toxic if LD50 was between 50 and 100 milligrams per
22 kilogram. Is that so?

23 A. That's correct.

24 Q. That's set out at page 70; is that
25 correct?

1 A. Yes.

2 Q. Is that, in your opinion, a
3 reasonable breakdown of classifications for toxicity?

4 A. That's not unreasonable.

5 Q. Did the authors find that as a class
6 N-Methylcarbamate compounds were the most toxic of the
7 insecticides tested against earthworms, and this is as
8 per Table 2 on page 72 -- sorry. Yes, I have switched
9 around the pages, I apologize. I am sorry, I may have
10 the wrong page reference.

11 Sorry, page 71, the statement is made:

12 "As a class, the N-methylcarbamate
13 compounds were the most toxic of the
14 insecticides tested against earthworms."

15 MR. MARTEL: Where are we on that page?

16 MS. KLEER: This is page 71 on the second
17 full paragraph, first sentence.

18 Q. Just for clarification, carbaryl is
19 N-methylcarbamate compound; is that correct?

20 MR. CRAIG: A. Yes.

21 MS. PALOWSKI: Where are you reading
22 from?

23 MS. KLEER: Page 71, the paragraph
24 beginning: "As a class..."

25 MR. CASSIDY: Second full paragraph on

1 the right-hand side?

2 MS. KLEER: Yes.

3 Q. Is that what the report indicates?

4 MR. CRAIG: A. Yes, that's correct.

5 Q. Well, they indicate at page 71, if
6 you go on in that sentence -- or, sorry, in that
7 paragraph, that:

8 "This result was consistent with what
9 other investigators have shown."

10 Is that correct?

11 A. Yes, that's reasonable.

12 Q. Now, this result studying the
13 toxicity of carbaryl is in line with what Voronova
14 showed in his field study; is that correct?

15 A. Yes, it is consistent with their
16 findings because the applied dosage exceeded the LC50
17 by -- well...

18 Q. What is the LC50?

19 A. The LC50 for a number of these
20 compounds was -- well, let's say, in the order of about
21 three micrograms. The LC50, if we look at Table 2 on
22 page 72 of Exhibit 1262, the LC50 for the number of
23 these carbamate insecticides range from .3 to 9, let's
24 say on average about three, micrograms a square
25 centimeter, and

1 Q. So -- I'm sorry.

2 A. I may just have to run a comparison.
3 I have to compare that with the dosage that was
4 reported in Exhibit 1261 on Table 1, but I would
5 anticipate --let me just see.

6 If we look at the .3 grams of Sevin in
7 this case applied to each square meter, in the Voronova
8 study that equates to 30 micrograms per centimetre,
9 which is three to ten times the concentration that is
10 reported as the LC50.

11 So that's clearly consistent. If one
12 applies more than the LC50 of a chemical to a plot of
13 land, one would expect the earthworms in that plot to
14 suffer mortality, yes.

15 Q. So you would agree that if you had
16 studies that showed that the level of exposure for
17 earthworms was something on the order of 10 micrograms
18 per centimetre squared, that would be an indication of
19 there being toxic effects; is that correct?

20 A. I'm sorry, what are your numbers
21 again?

22 Q. Ten micrograms per centimetre
23 squared.

24 A. Ten micrograms.

25 Q. I am just referring now to the LC50

1 of carbaryl shown in Table 2.

2 A. Yes.

3 Q. All right. So in your opinion then
4 it is fair to say that carbaryl, all apart from
5 exposure, is very toxic to earthworms if it reaches
6 them?

7 A. If it reaches them at a lethal
8 concentration.

9 Q. Very toxic -- I am just comparing --
10 as compared to other substances, as this author has
11 done in this study?

12 A. Yes, it takes less mass of that
13 chemical than other chemicals to produce the mortality.

14 Q. All right.

15 A. But that's simply what this paper
16 describes, is the relative toxicity of various
17 chemicals to the earthworm and it just identifies that
18 carbaryl is among the more toxic of those.

19 Whether -- to determine whether or not an
20 effect is likely to result is entirely dependent on the
21 concentration of exposure. It doesn't matter how toxic
22 the chemical is.

23 Q. No, I appreciate that.

24 A. Yes.

25 MS. KLEER: I will be moving into a new

1 area if I were to begin, so...

2 MADAM CHAIR: All right. Why don't we
3 stop here for today then, Ms. Kleer.

4 MS. KLEER: All right.

5 MADAM CHAIR: And you will be back at
6 nine o'clock tomorrow morning.

7 MS. KLEER: Nine o'clock, yes, and I hope
8 to be an hour and a half at the most.

9 MADAM CHAIR: Ms. Seaborn will be -- Mr.
10 Freidin, you will be following.

11 MR. FREIDIN: I am still hoping to be in
12 the two-hour range, maybe a little longer. I have some
13 questions that have developed since I gave my estimate
14 yesterday, but still within the two hour range.

15 MADAM CHAIR: All right. Ms. Seaborn?

16 MS. SEABORN: Madam Chair, based on the
17 questions I have heard today I will substantially under
18 my one hour estimate. I don't want to repeat areas.

19 MADAM CHAIR: All right, thank you.

20 Mr. Cassidy, do you have any sense of the
21 time you will need?

22 MR. CASSIDY: Unless things change
23 drastically I am going to be substantially under one
24 hour now as well in my re-examination.

25 MADAM CHAIR: Well, then, we should

1 finish tomorrow.

2 MR. CASSIDY: Yes.

3 MADAM CHAIR: We will finish tomorrow.

4 Thank you. Thank you, gentlemen of the
5 witness panel. You are finished for today and you are
6 invited to stick around if you want.

7 DR. SCHIEFER: Thank you.

8 MR. FREIDIN: Madam Chair, another little
9 announcement before we start. You may recall that in,
10 I think, November of '89 the Ministry led some evidence
11 on the Crown Timber Act and its proposed amendments.

12 I would just like to advise that a bill
13 was tabled in the legislature by the Minister of
14 Natural Resources today and for your information I have
15 a copy of that bill. A letter has been sent to all of
16 the parties with a copy of the bill which was tabled as
17 well.

18 They won't have their copies but, again,
19 as a matter of courtesy I provide the Board with a copy
20 of the bill. I don't believe it needs to be made an
21 exhibit. It may be spoken to at some later date.

22 MR. MARTEL: Maybe they could move two
23 trees for one again.

24 MR. FREIDIN: Sure.

25 MR. CASSIDY: It this the Thunder Bay

1 charter?

2 MR. MARTEL: This is the Brampton
3 charter.

4 MR. CASSIDY: Part two.

5 MADAM CHAIR: Mr. Freidin, can you remind
6 the Board, when was the last time there was...

7 MR. FREIDIN: An amendment?

8 MADAM CHAIR: An amendment to the Crown
9 Timber Act.

10 MR. FREIDIN: The last major revision
11 took place to that Act in 1979. That was when there
12 was the introduction of forest management agreements,
13 that set of amendments, which Mr. Martel is aware.

14 MADAM CHAIR: Thank you, Mr. Freidin.

15 Ms. Seaborn?

16 MS. SEABORN: Madam Chair, I have one
17 additional procedural matter that I wish to raise
18 today, I can either deal it with it now or at the
19 conclusion of Panel 9A tomorrow afternoon.

20 It is with respect to the question you
21 asked the Ministry of the Environment a couple of
22 months ago and I neglected to provide a response and I
23 am sorry for taking so long. It was an oversight
24 rather than having difficulty in obtaining the
25 information. You had asked with respect to a

1 particular exemption order, whether it had any bearing
2 on the class environmental assessment and I think I can
3 give a one-minute response if you will like me to
4 continue to deal with that now.

5 MADAM CHAIR: All right. Why don't you do
6 that, Ms. Seaborn.

7 MS. SEABORN: The particular exemption
8 order, for the record, Madam Chair, was exemption order
9 26/7. I have another copy of it and perhaps I will
10 just hand it to you for the purpose of my comments in
11 the event that you don't have yours with you.

12 MADAM CHAIR: Yes, we don't. We usually
13 carry it everywhere with us but we forgot it today.

14 MR. CASSIDY: It's under your pillow.

15 MS. SEABORN: Madam Chair, this exemption
16 order has been in existence for some ten years. It has
17 renewed on a regular basis, so the regulation that came
18 into effect in early 1990 is not a new regulation. As
19 I said, this is an exemption order that's been in
20 existence for ten years.

21 It is essentially an administrative
22 regulation that formalizes an understanding between MNR
23 and MOE whereby MNR would provide certain information
24 to MOE when a process has dispositions pursuant to the
25 exemption order, and I guess the long and short of it

1 is that in your view the exemption order has no bearing
2 on the undertaking that is under currently before the
3 Board and that is essentially because the undertaking
4 of timber management on Crown lands is already subject
5 to the Environmental Assessment Act.

6 Now, Madam Chair, I have handed you a
7 copy of the exemption order and would ask that if you
8 turn to condition 13 you will see the authority for the
9 proposition that I have just put to you with respect to
10 the fact that this exemption order really has no
11 bearing on the application that's in front of you.

12 You will see that it says under 13:
13 "Where a disposition which would
14 otherwise be exempt under this order is
15 being carried out in connection with or
16 is part of an undertaking for which an
17 environmental assessment has been
18 done..." and in this case we have an environmental
19 assessment for timber management that's before the
20 Board,

21 "...and approval to proceed received."

22 Now, obviously approval to proceed has
23 not been received with respect to this particular
24 application. Then it goes on to say:

25 "The disposition shall not being be

1 exempt under this order, but shall be
2 carried out in accordance with the
3 approval to proceed."

4 And it is my information from the
5 Ministry of the Environment that the effect of
6 condition 13 is that if you had a disposition of Crown
7 resources which might otherwise, for whatever reason,
8 fall within the ambit of the exemption order, that
9 exemption order will not apply with respect to that
10 disposition if the disposition is covered by the class
11 environmental assessment that you are looking at today.

12 I don't know if that's clear and maybe I
13 will just wait and if you have further questions I can
14 try and be of assistance.

15 MADAM CHAIR: I think that's fine for
16 now, Ms. Seaborn.

17 MS. SEABORN: Thank you. Perhaps I could
18 get that copy back from you.

19 MADAM CHAIR: Thank you.

20 We are here to discuss which parties will
21 follow Forests for Tomorrow in the presentation of
22 their evidence to the Board. We expect that the second
23 intervenors case will begin in January of 1991. We
24 have Forests for Tomorrow's estimate that they think
25 their case will be presented to the Board beginning in

1 October and lasting in the order of three months, I
2 think is Ms. Swenarchuk's most optimistic view of the
3 amount of time it will take.

4 For purposes of scheduling, I think the
5 Board will assume that the optimistic starting date for
6 the second party will be January, earlier January 1991
7 in the event that Ms. Swenarchuk is faster than she
8 thinks. Is she will be we will have someone ready to
9 step in and begin. That gives the parties to follow
10 six months notice of the preparations they will have to
11 make do that and, as it stands now, the Board sees five
12 parties presenting cases.

13 Well, four parties. We have some
14 question about NOTOA given that there has been a
15 change. We received today, and I don't know if the
16 other parties are aware of this, we received a notice
17 that Mr. Bob Edwards is no longer representing NOTOA.
18 We have no idea how this will affect their
19 participation in the hearing, it may not, I have no
20 idea what the situation is there.

21 In any event, they are a question mark in
22 terms of whether they are going to present a case and,
23 if so, when and we never knew where at any rate.

24 So I think we are looking at four major
25 parties today and those parties being the Ontario

1 Federation of Anglers & Hunters, NAN, Treaty 3 and the
2 Ontario Metis and Aboriginal Association.

3 As far as we know, there are no other
4 major parties at this hearing who will want to present
5 a case to the Board, other than those who will appear
6 at satellite hearings, and there is always a question
7 of the Ministry of environment. We might get into that
8 discussion today as well.

9 Am I wrong? Do the parties know of
10 any -- I think that that is it with respect to
11 scheduling a case. Other parties who have indicated an
12 interest have either backed down or have not responded
13 to our repeated inquiries about what they intend to do
14 and whether they are still participating. That's where
15 we stand.

16 So what the Board wants to do this
17 afternoon is to hear from each of the parties with
18 respect to their preparations. Obviously, your cases
19 are at some point in being preparing and we want to
20 know your plans before we set out a ruling about which
21 parties will appear before us in which order.

22 Did you want to go first, Ms. Kleer, or
23 Mr. Hanna, it is entirely up to you.

24 MS. KLEER: I have no preference.

25 MR. HANNA: I don't want to be sexist,

1 but ladies first.

2 MS. KLEER: Oh, that's not fair.

3 MR. CASSIDY: That is sexist.

4 MR. HANNA: I don't want to be, but I am
5 still a gentleman. Ladies first.

6 MS. KLEER: All right. We have met with
7 our clients to discuss how we want to put our witnesses
8 out.

9 We will be calling or we intend to call
10 some trappers, hunters, fishers and in that respect the
11 trapping season, as far as I know and as far as we
12 could confirm, ends somewhere mid March; therefore, we
13 would prefer to go on in the spring so that we could
14 have those witnesses available.

15 And in terms of how long our case will
16 be, that really hasn't been determined because we
17 haven't yet contacted those witnesses. We expect to
18 have some expert evidence as well. I would anticipate
19 a month to six weeks total, but that's a very ballpark
20 figure at this point, but, as I say, if possible we
21 would like to commence in the spring. There is also
22 the concern that we will be in Sioux Lookout.

23 MADAM CHAIR: And that's firm?

24 MS. KLEER: That's as firm as we know.
25 There is the possibility that we would also be in

1 Thunder Bay because a lot of NAN representatives are in
2 Thunder Bay.

3 MADAM CHAIR: In both places, Sioux
4 Lookout and Thunder Bay?

5 MS. PALOWSKI: It's NAN and Windigo.

6 MS. KLEER: That's right. Windigo Tribal
7 Council is a separate party, for all intents and
8 purposes, and they would be located -- the community
9 members are located in the Sioux Lookout area, whereas
10 Nishnawbe-Aski Nation has its head office in Thunder
11 Bay.

12 MADAM CHAIR: So over the six-week period
13 we would be in Sioux Lookout and Thunder Bay to hear
14 your evidence?

15 MS. KLEER: We may just be in one
16 location.

17 MADAM CHAIR: All right.

18 MS. KLEER: But potentially those two.
19 At any rate, if we were in Sioux Lookout, I would want
20 to be a little bit concerned about the weather and,
21 therefore, I think spring would be a better time.

22 Is there any other things you would like
23 to hear about for your consideration?

24 MADAM CHAIR: Is there anything else you
25 have to tell us about your case?

1 MS. KLEER: At this point --

2 MADAM CHAIR: You don't expect it to take
3 longer than six weeks?

4 MS. KLEER: We don't expect it to. As I
5 said, we haven't put together our witness statements
6 yet, so I can't be firm about that, but I would hope
7 that it would not be longer than six weeks.

8 MADAM CHAIR: We've had some indication
9 that Treaty 3 wishes to follow you and further
10 indication that the Ontario Metis and Aboriginal
11 Association wish to follow Treaty 3.

12 MS. KLEER: We have no objections to
13 that.

14 MADAM CHAIR: I certainly understand --

15 MS. KLEER: Excuse me for a second.

16 MR. CASSIDY: A minor point while Ms.
17 Kleer is conferring with her client Ms. Palowski.

18 Just to clarify. You indicated that the
19 second intervenor would start in January of 1991.

20 MADAM CHAIR: We would want them prepared
21 to start then in case by some unusual circumstance in
22 this hearing we were finished Forests for Tomorrow's
23 case within three months.

24 MR. CASSIDY: My client has always taken
25 the position that it is an intervenor as well, Madam

1 Chair, inasmuch as there is the proponent and everyone
2 else intervenes and it is essentially the proponent's
3 hearing for approval. So technically I would suggest
4 that in fact it would be the third intervenor starting.

5 MADAM CHAIR: Excuse me, Mr. Cassidy.

6 MR. CASSIDY: It is a minor point, I
7 - simply state that for the record.

8 MADAM CHAIR: I'm sorry.

9 MR. CASSIDY: Thank you.

10 MS. KLEER: My apologies. We had met
11 with our client Monday and they indicated that they
12 would prefer to go after Treaty 3 and OMA. We will
13 abide by your ruling.

14 MADAM CHAIR: Your client wishes to go
15 after Treaty 3?

16 MS. KLEER: Yes. It's simply for the
17 purposes of preparing our witnesses. We would like to
18 have the time to do that and that will take some time
19 and, for those reasons, we would prefer...

20 We will also have to arrange for
21 translators and things like that. That may be their
22 concern as well, but I would note for the Board's
23 information that we will probably require some
24 translators as well.

25 MADAM CHAIR: Thank you, Ms. Kleer.

1 Mr. Hanna?

2 MR. HANNA: Thank you, Madam Chair.

3 As the Board no doubt is aware in their
4 Rules of Practice and Procedure, Rule 47 provides
5 direction but not binding direction to the Board in
6 terms of order of presentation of evidence.

7 Rule 47 indicates that the order of
8 evidence should be first the applicant; second, parties
9 represented by counsel in support; third, parties not
10 represented by counsel in support; fourth, parties
11 represented by counsel opposing the proposal; fifth,
12 parties not represented by --

13 MADAM CHAIR: Sorry, Mr. Hanna.

14 MR. CASSIDY: I have a copy.

15 MADAM CHAIR: We have a copy up here
16 somewhere, but I don't think we are going to find it.

17 MR. CASSIDY: (handed)

18 MADAM CHAIR: Thank you, Mr. Cassidy.

19 MR. HANNA: Fifth, parties not
20 represented by counsel opposing the proposal; six,
21 regulatory bodies; seven, the Board's witnesses; and
22 eight, the applicant in reply.

23 In addition to Rule 47, there are other
24 considerations I think the Board should bear in mind in
25 making this decision. The other considerations that I

1 would suggest you consider is No. 1, those parties that
2 received intervenor funding and the nature and quantity
3 of intervenor funding that has been received; and,
4 secondly, in particular with respect to the matter of
5 NOTOA and my client, the length of time without
6 counsel, and I will address each one of those.

7 First of all, with respect to intervenor
8 funding, as the Board is only too aware, it is public
9 money, it is provided to assist the Board in making
10 their decision. We all, as parties to this hearing,
11 have a duty to the Board to provide you with the best
12 evidence possible in order to help you and assist you
13 in making a decision and intervenor funding money is
14 designed specifically for that purpose.

15 It is the position of my client that the
16 scope of evidence of parties not receiving significant
17 intervenor funding could be substantially and
18 materially influenced by the evidence called by parties
19 receiving intervenor funding.

20 In order for those parties not receiving
21 substantial intervenor funding to benefit, by that
22 public money provided to those other parties, it's
23 essential that their evidence follow those parties
24 receiving substantial intervenor funding.

25 The second matter is that of length of

1 time without counsel. As you know, the OFAH has been
2 without counsel since midway through the Ministry's
3 case. We had brought that to the Board's attention at
4 that time. As the Board has just announced, NOTOA is
5 now without counsel, but only this week, and has had
6 the benefit of counsel through much of the proceedings
7 to this point -- all of the proceedings to this point.

8 Now, looking at those factors in total, I
9 have come to the following conclusion that I will
10 recommend to the Board to consider the following order,
11 that NAN, Treaty 3 and the Ontario Metis Association
12 should proceed before the Ontario Federation of Anglers
13 & Hunters.

14 As far as the orders in which those
15 parties appear, my client has no position at this
16 point.

17 With respect to NOTOA, it is unclear at
18 this time whether NOTOA is going to present evidence,
19 it is unclear where that evidence might be presented,
20 and I'm not really in a position to give you perhaps
21 the best advice I could without that information
22 available to me. I would say that if NOTOA does decide
23 to present evidence and we are having the three native
24 organizations presenting evidence and that evidence is
25 being presented in Thunder Bay or one of the northern

1 communities and NOTOA, likewise, wishes to present
2 evidence in the northern communities, it only makes
3 sense to have their evidence follow concurrently or
4 consecutively with that of those three parties.

5 I should indicate, however, my client is
6 not affixed in that position, we are quite flexible in
7 that and we will be open to discussing that further in
8 terms of what's the most appropriate order in terms of
9 making it most practical and most efficient for the
10 Board.

11 In terms of the other three parties, my
12 client firmly believes that in order for the Ontario
13 Federation of Anglers & Hunters to obtain the benefit
14 from the significant public monies that have been given
15 to the other three parties that their case should
16 follow, that of those parties.

17 Those are my submissions, Madam Chair.

18 MADAM CHAIR: Thank you, Mr. Hanna.

19 Mr. Hanna, will your client be retaining
20 counsel for the presentation of its case?

21 MR. HANNA: Madam Chair, I am on the
22 record as indicating to the Board that as a result of
23 my duties as agent for the Federation that that
24 potentially would eliminate me as a potential witness.

25 As you may be aware in the Code of

1 Practice that the Law Society puts out, there is a
2 clause that indicates that counsel should not appear as
3 witnesses in a hearing.

4 Now, I am appearing as an agent, I have
5 made a commitment to this Board to abide by that Code
6 of Practice and there is discussions ongoing at the
7 present time with my client as to whether it would be
8 appropriate for me to give evidence before this Board,
9 that has not been determined at this time. One of the
10 things that we are investigating is approaching the Law
11 Society and determining the full rationale for that
12 clause and whether or not my appearances would violate
13 the essence, the reason for that ethical rule.

14 My expectation at this time is I will be
15 acting as the agent for the Federation for their case.
16 As I say, that's not fully clarified at this time, but
17 that is my expectation.

18 MADAM CHAIR: And will your case be
19 presented in Toronto, Mr. Hanna?

20 MR. HANNA: We have indicated that our
21 preference is to have the case presented in Toronto,
22 Madam Chair.

23 MADAM CHAIR: Do you have any sense of
24 how long it will be?

25 MR. HANNA: There are matters outstanding

1 that will influence that. I would not expect the case
2 to go more than two months but, again, I am in the same
3 situation as Ms. Kleer, having not prepared witness
4 statements at this point.

5 We are in regular communication with
6 individuals who may appear as witnesses, but the full
7 extent of the evidence that we will presenting is
8 contingent on a number of factors which are outstanding
9 at the present time.

10 MR. FREIDIN: That's two months including
11 cross?

12 MR. HANNA: We won't be two months in
13 evidence-in-chief, I can assure the Board of that. In
14 fact, I anticipate that our evidence-in-chief will -- I
15 should be careful in binding myself here, I know Mr.
16 Martel will listen carefully and bring these words back
17 to me, but I am anticipating that we will prepare our
18 witness statements in such a way that the
19 evidence-in-chief will be extremely limited.

20 MR. MARTEL: I have a concern and I am
21 not sure how to deal with it, Mr. Hanna.

22 If the native people, their witnesses are
23 in fact trappers and hunters and so on, who are doing
24 their -- gaining much of their livelihood in the three
25 or four months available to them, that could pose a

1 severe hardship on a number of native people who don't
2 have very much to start with, and I am wondering if
3 your client has taken that into consideration.

4 MR. HANNA: Yes, we certainly have taken
5 it into consideration and I certainly appreciate the
6 essence of what you are saying, Mr. Martel.

7 I believe that that issue is going to be
8 faced no matter what time and who the witnesses are. I
9 might even say that some have less than others and,
10 therefore, are faced with potentially greater hardship.

11 We are faced with calling in people from
12 jobs trying to make an income like everyone else.
13 Those people have contributed a very significant amount
14 of money, their own personal money, in addition to
15 contributing to the other parties' cases through their,
16 if you will, being members of the public and paying
17 taxes like us all.

18 I think you are faced with -- I think the
19 Board is faced with that problem whether we go first or
20 whether we go last, because if the cases extend -- if
21 our case goes for two months and we were to finish by
22 the end of February, you still have trapping season
23 facing, at least a month, at least four weeks of those
24 trappers time and once trapping season is over we then
25 have got commercial fishing, we have got all the other

1 activities that both the Indian people are faced with
2 and many of our members are faced with.

3 If NAN's evidence were to be six weeks
4 and they have a witness on the stand, that witness is
5 on the stand for maybe a week at worst. I think that
6 sort of a commitment to this sort of a hearing is no
7 more than the level of commitment that many dedicated
8 anglers and hunters in this province have made, the
9 case the Ontario Federation of Anglers & Hunters has
10 put forward which has cost them of their money, no
11 public money at all, in excess of a third of a a
12 million dollars. That's a very substantial investment
13 and a very substantial commitment by that group.

14 I don't mean by saying that that the
15 Federation in any way is insensitive to what you are
16 saying. I think we are all faced with sacrifices and
17 if we are talking about a sacrifice of one trapper or
18 one week out of a population, I won't guess the number,
19 I don't feel that that is an unfair sacrifice.

20 I think it is something that has to be
21 taken into consideration, I'm sure the Board will, and
22 my client has taken it into consideration, but I don't
23 feel it is an unfair sacrifice.

24 MADAM CHAIR: Ms. Seaborn?

25 MS. SEABORN: Madam Chair, I don't have

1 instructions yet from my client as to whether or not we
2 are going to call evidence. There is really nothing
3 more I can say on that.

4 It has always been our anticipation --we
5 had always anticipated that if we do call evidence we
6 will follow at the end of the order, in any event.
7 Unfortunately, it doesn't appear that that time is
8 going to be very soon.

9 In terms of the location for the
10 evidence, we are prepared to call the evidence wherever
11 is most convenient for the Board and --

12 MADAM CHAIR: Mr. Martel said Capreol.

13 MR. HANNA: Where is Capreol.

14 MR. MARTEL: Right near Sudbury.

15 MS. SEABORN: I am not surprised Mr.
16 Martel is suggesting the Sudbury area for a change.

17 So in terms of the logistics of fitting
18 in our case, should I receive instructions to call
19 evidence, we will be prepared to call that evidence.

20 MADAM CHAIR: And you will also be
21 prepared to voluntarily limit yourself to a very short
22 period of time in the sense of how long the case has
23 taken so far, you wouldn't want to add a lot of time to
24 it?

25 MS. SEABORN: This is certainly one of

1 the reasons why the determination as to whether or not
2 we are going to call evidence has not come to a
3 conclusion. We are very cognizant of the length of the
4 hearing and we do not want to put in evidence that will
5 be repetitious.

6 On the other hand, there are some
7 discreet areas that my client feels that after having
8 heard some of the intervenors evidence it may be
9 necessary for the Ministry to bring forward some
10 witnesses on some discreet issues, but it will not be a
11 case that will go on for months.

12 MS. KLEER: One more comment. If the
13 Board wishes, we would be willing to undertake who goes
14 first between NAN, Windigo and OMA if that were to help
15 you.

16 MADAM CHAIR: Yes, I think that would be
17 helpful.

18 MS. KLEER: Okay. We can arrange that.

19 MADAM CHAIR: It might be a good starting
20 point if you could learn from those two parties fairly
21 quickly how long they think their cases will be.

22 I think Mr. Colborne has said that he
23 wouldn't expect to be even a month, but we don't have
24 anything right now.

25 MS. KLEER: All right. We will undertake

1 to speak with them and we will advise the Board.

2 MADAM CHAIR: Thank you.

3 MS. SEABORN: Madam Chair, I did want to
4 make one comment with respect to the scheduling of
5 other intervenor's presentations.

6 Given that the logistics appear to be one
7 of the primary concerns with respect to scheduling,
8 that's something the Board needs to address obviously
9 in the context of the satellite hearings, a number of
10 satellite hearings have to obviously be fit in and
11 there is a question as to when do we go to the Sudbury
12 area, for example, and --

13 MADAM CHAIR: Actually we don't have a
14 satellite hearing in Sudbury.

15 MS. SEABORN: Don't we have one in North
16 Bay?

17 MR. CASSIDY: We are going to Espanola,
18 though.

19 MADAM CHAIR: We are going to Espanola in
20 September.

21 MR. CASSIDY: It is not the same, is it,
22 Mr. Martel?

23 MR. MARTEL: Eighty miles.

24 MADAM CHAIR: Yes, we do have the New
25 Liskeard/North Bay hearings and the expectation is that

1 we would hear something about the Temagami situation
2 there. Given that possibility, we have no idea how
3 long that would take.

4 MS. SEABORN: That's correct. That was
5 the particular location that I was thinking of.

6 But in terms of the order of presentation
7 of the other intervenors, we do have a limited number
8 of parties that we have to deal with and I think one
9 thing that has to be taken into account is, for
10 everyone, the logistics of being in Toronto, moving
11 somewhere else, coming back to Toronto and then moving
12 to another main hearing location, and that always
13 causes difficulties that results in loss of hearing
14 time.

15 So we would certainly support a proposal
16 that would take into account all those logistics.

17 MADAM CHAIR: I think the problem with
18 scheduling satellite hearings after Forests for
19 Tomorrow's case is that we just don't know when it will
20 be over; therefore, we can't sent out notice, we can't
21 schedule a satellite hearing after that. We have to
22 have a party ready on deck to immediately follow.

23 MS. SEABORN: I suppose, Madam Chair,
24 what I was thinking of, we did one week where we fit in
25 Fort Frances during--

1 MADAM CHAIR: Yes, much to our regret.

2 MS. SEABORN: --during the OFIA case.

3 MADAM CHAIR: Yes, much to our regret
4 because we would have finished the OFIA case had we not
5 sat in Fort Frances.

6 We won't do that again, we have learned
7 our lesson well, believe me. The satellite hearings
8 will be put off until we sort out the scheduling. It
9 is much more predictable to say yes, give a set date
10 for a case to start. Possibly not meet that deadline,
11 but people will be ready in any event.

12 MR. HANNA: Madam Chair, if I might
13 submit to you that one thing you might consider -- I
14 was just thinking about what you said in terms of
15 logistics for satellite hearings. I think there is a
16 30-day notice period for the satellite hearings.

17 MADAM CHAIR: Actually, I think it's
18 closer to 40 days, but we can -- 60. We can change the
19 dates slightly.

20 MR. HANNA: Well, what I was thinking is
21 that given what Ms. Kleer has indicated, in terms of
22 the difficulties with the period, I gather her concern
23 is in the January/February period, that that might be a
24 possibility, to schedule some of the satellite hearings
25 as a way to provide some time for -- some greater time

1 for her in terms of preparation.

2 MADAM CHAIR: We have no idea when
3 Forests for Tomorrow's case will end, though. They
4 could take a month or two longer than they think,
5 hopefully not, most assuredly not that long, or they
6 could take a shorter period of time and we don't want
7 the Board adjourning because there is a mistake in
8 schedule.

9 We simply won't sit down for a month and
10 have nothing to do because we have scheduled a
11 satellite hearing that we can't change or...

12 MR. HANNA: But the reason we ended up
13 with the problem here, as I understand it, Madam Chair,
14 is that we were coming up against the summer break and
15 that's what has led to the difficulties we have had in
16 scheduling Panel 10.

17 MADAM CHAIR: The Fort Frances satellite
18 hearing? When we we sat down, Mr. Hanna, we thought we
19 would be finished the Industry's case the first week of
20 June. We thought we had three weeks in June where
21 there would be nothing to do and we didn't want to
22 start another parties' case and then have the summer
23 break. So we thought we would have been finished even
24 with the Fort Frances hearing.

25 MR. HANNA: I understand that, Madam

1 Chair, that wasn't what -- what I was suggesting was,
2 having now lived through having the Industry's case
3 span the satellite hearing, at least from my client's
4 point of view, it has caused difficulties in terms of
5 the summer scheduling, but in terms of the Industry's
6 case, that break that we took, the one-week break that
7 we took to go to Fort Frances, at least in our view,
8 didn't interrupt the flow significantly of the
9 Industry's case.

10 So that one way to try and address the
11 concern that Ms. Kleer has raised in terms of the
12 timing that their case might occur would be to have
13 satellite -- at least one or two satellite hearings
14 during or towards the end, as best as you can estimate
15 it, of FFT's case and that will then provide for the
16 native groups some additional time in terms of
17 preparation of their evidence.

18 MR. MARTEL: But we have a problem if we
19 ever get to North -- we have only got after this
20 Ottawa, North Bay, New Liskeard, possibly Red Lake. If
21 we get into New Liskeard or North Bay we might never
22 get out.

23 MADAM CHAIR: Well, hopefully we will.
24 - We don't know how long, it might be a quick public
25 - hearing or it might be very long.

1 MR. HANNA: You aren't talking about the
2 local people, you are talking about the weather, Mr.
3 Martel?

4 MR. MARTEL: No, I'm not talking about
5 the weather, I'm talking about the presentations that
6 could well be forth coming once we start the process in
7 there, either one of them.

8 MADAM CHAIR: The only other satellite
9 hearing locations, we have Ottawa which will be -- if
10 the preliminary hearings were an indication, we will be
11 in and out of ottawa very quickly.

12 MR. FREIDIN: Ottawa, Toronto and Thunder
13 Bay are the three places where we have --

14 MR. CASSIDY: They seem to have other
15 things in their mind in Ottawa these days.

16 MADAM CHAIR: Yes. In Thunder Bay, we
17 would want to attach it to a -- if we are going to hear
18 evidence in Thunder Bay with a party we would put it
19 together at that point.

20 And Toronto, well

21 MS. KLEER: May I raise one other matter.
22 In terms of the preparation of witness statements, when
23 would you expect them? Is that going to be part of
24 your ruling?

25 MADAM CHAIR: Yes, it will have to be

1 because January -- if we set a date in January as the
2 start of a case then we will count back 60 days, which
3 would take us into November--

4 MS. KLEER: All right.

5 MADAM CHAIR: --as the first date to
6 start the witness statements being distributed.

7 MR. CASSIDY: Madam Chair, I am sure you
8 are referring to the term 6(a) of the Board's ruling
9 dated September 16, 1988, which, in just reviewing it
10 now, requires all parties in opposition to have their
11 witness statements in by the completion of Forests for
12 Tomorrow's case.

13 I bring that to the attention of Mr.
14 Hanna because even if he isn't going first, if he is
15 third, the provision of that order on its face requires
16 all parties to file them all at once. So that's for
17 Mr. Hanna's benefit or for any other party, for that
18 matter.

19 MADAM CHAIR: Did you catch that, Mr.
20 Hanna?

21 MR. HANNA: I didn't get the exact part
22 of the order.

23 MR. CASSIDY: Rule 6 -- I'm sorry, Term
24 6, paragraph (a) of the Board's order dated September
25 16, 1988 which is my reading of it.

1 MR. HANNA: What was the date on that?

2 MR. CASSIDY: September 16, 1988.

3 Sometimes it's handy to keep all the Board rulings in
4 one place, Mr. Hanna.

5 MR. HANNA: Sometimes it's handy to have
6 a Mr...

7 MR. CASSIDY: I do this myself for a
8 change.

9 MR. FREIDIN: Madam Chair, I don't know
10 what role it would play, if any, in your decision as to
11 scheduling the case of the other parties, but I believe
12 at the present time the Ministry would elect or ask
13 that it call its reply evidence in Toronto.

14 So whether that has any influence on how
15 you schedule the other parties, I don't know. There it
16 is.

17 MADAM CHAIR: How long are you going to
18 be with reply evidence, Mr. Freidin.

19 MR. FREIDIN: It is absolutely impossible
20 to tell. My only comment is, let's get it done.

21 MADAM CHAIR: Oh good.

22 MR. HANNA: Madam Chair, I did ask for
23 that ruling because -- for the very reason that I knew
24 that was in there. Unfortunately, when I received the
25 ruling from -- I'm not sure whether I received this

1 from the Board or whether I received it from -- I
2 received it from my office, I apologize, they did not
3 send me the most up-to-date ruling and that's what I
4 had asked them to send me, and I expect that I will be
5 potentially addressing you on that matter depending
6 upon the decision that you reach.

7 And the reason I suggest that is that for
8 the very reasons that I explained to you in terms of
9 the intervenor funding. If we are to benefit by the
10 public monies used to support the other parties' cases,
11 the only way we could benefit by that is having seen
12 the witness statement and then adjust our evidence
13 accordingly.

14 I don't mean to address that now at this
15 time, but I just say that I had asked for that ruling
16 in order that that matter came up and I may be
17 addressing you further on that at some point.

18 MADAM CHAIR: Well, I think now is the
19 time to address it, Mr. Hanna, because the Board's
20 ruling is clear and when we made that ruling in
21 September 1988 the idea was that we didn't want to have
22 any gaps in terms of the evidence following Forests for
23 Tomorrow's case, that we didn't want to have to have
24 parties not competing, but trying to follow one another
25 and this ruling in effect essentially eliminates that.

1 Whether you want to present your evidence
2 in January or February or March or next June, the
3 witnesses statements will have to be prepared.

4 MR. HANNA: Madam Chair, when this matter
5 was originally raised, as I understand it, the
6 discussion that took place at that time was to deal
- 7 primarily with satellite hearings and we talked about
8 order of presentation of the cases at that time.

9 We did submit to you on the matter, we
10 had not anticipated that ruling and I don't believe
11 that we are on the record in providing any statement to
12 the Board with respect to that particular ruling.

13 I understand what the Board is saying to
14 me, that there is some advantage in terms of having all
15 the evidence forward at one point; by the same token,
16 it does disadvantage those parties that were not
17 provided with substantial funds to support their case.
18 And as I understand one of the reasons that the Board
19 felt that FFT should go first was in order that other
20 parties could benefit by the evidence that they would
21 call, particularly given the amount of money that
22 they -- the amount of public money that they have
23 received.

24 It seems to mean only logical that that
25 same principle applies with respect to other parties.

1 MADAM CHAIR: Well, Mr. Hanna, I think
2 the idea that Forests for Tomorrow should go first was
3 not, I think, based on the amount of money they
4 received for intervenor funding, and I don't know what
5 that amount was, but I think it was -- it is because
6 they are a very large coalition of groups who had
7 access to various experts and would be able to prepare
8 a large, a very large case.

9 Whether they had received intervenor
10 funding or not, they would logically have been chosen
11 to go first to assist the intervenors in terms of the
12 knowledge that they would add, that would hopefully
13 assist the intervenors who followed.

14 MR. HANNA: Unfortunately, as far I know
15 That was never discussed before the Board.

16 It is my client's position that if you
17 are dealing with coalitions and that was the rule and
18 the basis, the OFAH should have gone ahead because I
19 believe that we represent something like three times
20 the membership and we have a coalition of much greater
21 number of organizations than FFT.

22 I only point that out. This is the first
23 time I've been aware of that -- of the reasoning behind
24 that.

25 MADAM CHAIR: I don't think it is the

1 size of the membership of the organizations, it is the
2 matter of the extent to which they have committed the
3 participation of experts to the situation, the extent
4 to which they have indicated that they are going to
5 participate fully in the hearing.

6 Now, I certainly understand your concern
7 about intervenor funding and I am not suggesting in any
8 way that Forests for Tomorrow's contribution is more
9 important to our decision than the contribution of your
10 client would be.

11 I am saying simply, it has always been
12 understood in the Board's mind that Forests for
13 Tomorrow had resources in terms of mounting a case that
14 we thought would benefit other intervenors.

15 MR. HANNA: Madam Chair, I would stand by
16 what I said, that it is my client's position that in
17 order for other parties to benefit by the substantial
18 amount of public money that has been invested in other
19 parties' cases, that the order should reflect that and
20 in order for that benefit to be realized, that the
21 presentation of witness statements should be staged
22 accordingly.

23 MS. SEABORN: Madam Chair, if I might, I
24 would like to just ask Mr. Hanna one question of
25 clarification.

1 I take if, Mr. Hanna, you are not
2 suggesting that you go after the other intervenors
3 because your client is a party that's unrepresented by
4 counsel? You started off your submissions by referring
5 to Rule 47.

6 MR. HANNA: No, not at all, Ms. Seaborn.
7 The reason I referred to Rule 47 is because it sets out
8 as a preliminary and perhaps the basis upon which I
9 would suggest the Board to discard in terms of arriving
10 at a conclusion as to the appropriate order. That's
11 the reason why I brought out Rule 47.

12 And it is clear from Rule 47 that while
13 it is not binding on the Board, it is directed to the
14 Board in terms of what might be an appropriate order,
15 unless other circumstances intervene, and on that basis
16 clearly the Ontario Federation of Anglers & Hunters
17 should follow the three native organizations, all of
18 which have counsel.

19 MS. SEABORN: That was why I asked the
20 question, Mr. Hanna. Are you making your submissions
21 that you go after those parties based on that rule
22 because in the same breath you said you had some
23 concern because of an undertaking you had given to the
24 Board of acting as a counsel in this hearing.

25 I don't want to take up the Board's time

1 discussing this, but I was just unclear as to whether
2 you are relying on that rule to go after the native
3 groups or whether you were just beginning your
4 submissions by reminding the Board of that particular
5 provision.

6 MR. HANNA: Well, Ms. Seaborn, as you are
7 are well aware, I am not counsel, I am not in any way
8 counsel and I am not trying to go after anyone, let
9 alone the native groups.

10 I am simply saying that is a reasonable
11 basis for this Board to start in determining what is a
12 fair and reasonable order. I think it is clear that
13 the Ontario Federation of Anglers & Hunters is not
14 represented by counsel, and the other matter that I
15 would suggest to the Board to take into consideration
16 in arriving at their decision is that matter that I
17 have spoken of in terms of intervenor funding.

18 And I would add, given the comment of Mr.
19 Freidin in response to a comment that Ms. Seaborn made
20 in terms of logistics, given that the Ministry's reply
21 evidence will be called in Toronto, that logistically
22 there's an argument for the Ontario Federation of
23 Anglers & Hunters' case, to also be called in Toronto,
24 preceding that on a logistical basis.

25 MADAM CHAIR: Do any parties have

1 anything they wish to add to this discussion?

2 (no response)

3 I think we could have had this discussion
4 probably this time last year as well and we would have
5 found ourselves in pretty well the same situation.

6 It is probably embarrassing to all of us
7 that we have already been in this hearing for two years
8 now and we are talking about preparing cases six months
9 off into the future and we are still having some
10 concerns about when they start, but the Board is very
11 sympathetic to that.

12 We are very sympathetic to the
13 difficulties it is for all the parties to participate
14 in a hearing this long. It has been a terribly
15 expensive process and the Board doesn't want to add to
16 the difficulties that the parties are having in their
17 participation.

18 So we will take away all your comments
19 and discuss what we will do next.

20 It would be very helpful if you could
21 give us some information about the other two parties
22 with respect to where they want to present their
23 evidence and how long they think their cases might be.

24 MS. KLEER: We will do that, Madam Chair.

25 MADAM CHAIR: Thank you very much. We

1 will see you tomorrow at nine o'clock.

2 ---Whereupon the hearing adjourned at 5:50 p.m., to be
3 reconvened Thursday, June 21, 1990 commencing at
4 9:00 a.m.

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